MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association Northern Minnesota Medical Association and Minneapolis Surgical Society

VOL. VII AUGUST, 1924 No. 8

ORIGINAL ARTICLES

TWENTY YEARS' OBSERVATION OF TUBERCULOSIS CONTROL IN MINNESOTA*

E. L. TUOHY, M.D.
Duluth, Minn.

This period includes my final year in the medical school, a period of some years devoted to public health in an outpost of the State Board of Health in Duluth, a year of graduate European study, chiefly in Vienna, in 1912, and the decade following thereafter. In this period I have had my connection with Nopeming Sanitarium, as chairman of the Tuberculosis Commission appointed by St. Louis County.

I must state that in the more recent years the problems concerned with tuberculosis have been merged into the consideration of a multitude of others customarily encountered in the diagnostic and therapeutic problems of a general clinic and hospital practice.

It may seem presumptuous to you to have me make this segmental analysis, basing it upon my own life experiences. Nevertheless, this has been a very active period in public health as a whole, and any statistical analysis of the reduction in death rate, including those from tuberculosis, will show that much has been accomplished. Presently the great problem before us is to continue the good work and to focus our attention upon the situations immediately facing us, because further declines in death rates are not likely to come as easily as is sometimes supposed.

Considering that little was done in Minnesota up to twenty years ago in tuberculosis prevention, points the obvious fact that there was much to do; that which remains to be done, even in a winning contest, will require much co-operation and foresightedness.

*Read by invitation before the medical staff of the Lymanhurst School for Tuberculous Children and the Parkview Sanatorium, June 27, 1924.

In 1904 it seemed to our clinical teachers that the outspoken problem in pulmonary tuberculosis was to *find the early case,* in order to cure it. The teaching of the Germans, Brehmer and Dettweiler, had borne fruit; the beacon of hope lighted and tended through years of struggle in the Adirondacks by Trudeau, had been sighted all over our land; Massachusetts, in 1898, had led the way with a state sanatorium; Minnesota was gathering plans for the institution at Walker; all were intent on breaking down the awful conviction of the average intelligent man: "Consumption is incurable." In that year of teaching, when exact and firm rules were laid down regarding the diagnostic use of tuberculin, the National Association for the Prevention and Relief of Tuberculosis was formed. Tuberculin, and with it all specifics for practical therapy in pulmonary tuberculosis, has been a failure; the National Association and its widespread branches have been a profound success.

We should record in passing that no early sanatoria got the "incipient" cases they were looking for; there were no "preventoriums" such as this institution where this meeting is held tonight, which is such a brilliant and successful example. Some of those we rounded up with ripping reactions after tuberculin took us very seriously; most of them sought medical advisors with less curiosity as to tuberculosis immunity, but better judgment as to general competency. Most cases labeled "incipient," and with "a slight touch in one apex" at home, were advanced cases when they got into the burdened institution. Non-tuberculous lesions of the lungs got scant courtesy from the general man, and the specialist even now is not free from the accusation that he is slow to consider them. In short, 1904 to 1912 was a period of rising hope on the part of doctors, but the deepest of despair on the part of patients, toward consumption; this disease provided the great predominant *fear* implanted in the minds of the persistently sick—a place now most certainly usurped by the fear of cancer. (We might well discuss in passing the grave need on the part of the medical profession of abating sense-

less fear. Particularly is this necessary where our well planned educational efforts yield the unhappy by-product of apprehension on the part of those who misapply our instructions or get them badly mixed up.)

The International Congress on Tuberculosis in Washington in 1908 had a most profound impression upon tuberculosis in America. From it some of us brought back some deep convictions that have meant much to the campaign in Minnesota. It is doubtful whether many states have plunged into a campaign any more heartily than did Minnesota; few states have been as rapidly or as successfully institutionalized for the prevention and care of tuberculosis. Newsholme and Koch were the outstanding figures of this congress. It may seem incongruous to mention them in the same breath; the one a statistician, the other a medical hero. Nevertheless, Koch, at the Congress, was like a general returning after a great war; his work had been done so well that even he never improved upon it; he was expected to produce a specific cure, and was never able to do it; therefore, he graced the program by his presence. Newsholme made the program. After the Russians had finished dangling their numerous medals; after the bearded French had ceased sputtering; after even the American "Billy Sundays"—each and all had ornamented the great record of the Congress—we all went home remembering chiefly what Newsholme had said, "We are checking tuberculosis in England by hospitalizing the advanced cases."

Another incident of the Congress is well worth recording. In a back recess among the exhibits were some roentgen plates from the irascible but most ingenious pioneer in roentgenology—Cole of New York. I was among the many who gave the few pictures he had a most casual glance and hastened on to a digest of the "57 varieties of tuberculin." There were indeed those present who were vehement about the preposterousness of injecting any such mechanical objective artifice into a problem that was so obviously subjective and concerned only with the diagnostician's cerebrum properly linked up with his own pet stethoscope. Now, in retrospect, it is evident that this despised artifice has become a "godsend" to clarify the many disturbing questions involved in proper and safe chest diagnosis. To it is due much of the honor of lifting the fear of tuberculosis from the souls of that frenzied fringe of humanity that is always the first to drink in our health propaganda, and who are invariably the ones least in need of the draught. Chest roentgenology has done much more, but this is only a sketch and not a proportionate tribute.

At this point I wish you to travel in imagery to the confines of the "Kinder Klinic" near the Allegemeine Krankenhaus in Vienna. The time is April, 1912. Hamburger it was who talked when I entered the room. He was looking at a von Pirquet reaction on a child's arm, and he was putting forth dispassionately the story of "the primary lungen herd" in tuberculosis. This was my first introduction to the idea that tuberculosis was not the result of a cumulative exposure, on the same principle that one gets wet if it rains long enough on ordinary clothing. Soon thereafter I was permitted on numerous occasions to see the classical finding of "truly incipient tuberculosis" in the lungs of children autopsied under Erdheim. I became tremendously imbued with this most striking pathological entity. This explained why we did not have any "incipient tuberculosis" either in our offices or in our sanatoria at home.

The contention of only one probable infection with tuberculosis, and that in childhood, has gained American recognition very slowly. So far as I know, the pediatrists as a whole have quite accepted it; the older American internists have likely been the most skeptical. It is quite inopportune to further discuss the arguments pro and con that have been so much mooted. In like manner, it is quite useless to agitate the question relative to the relationship in childhood infection of bovine or human tuberculosis. Let us agree that no doubt adults may acquire tuberculosis freshly; let us likewise agree that the bovine bacillus may infect children; but, let us just as eagerly and willingly agree that most children now inoculated will get this insult via the bronchial tree from a human source; that tuberculous cattle are unprofitable and should be exterminated. Any pathologist who is willing to carefully autopsy the lungs of children will find, if he is willing to look for them, the single or multiple nodes, usually in the lung periphery, with regional lymph gland enlargement, the infectious tract being virtually the "chancre of tuberculosis." Reinfection is possible in any disease, but it is not likely with many infectious, including typhoid and syphilis. The idea of a single infection or inoculation with tuberculosis is not incompatible with the soundest reasoning and keenest analysis. It has

steadily driven home to us the inevitable conclusion that it is impossible to house children and open cases of tuberculosis in the same room; it is unreasonable to expect that highly virulent organisms fresh from the host in probably massive dose, will not produce an inoculative lesion that may not only check the immediate life of a child but challenge its likelihood for continued growth and existence at any time thereafter. It also focuses our attention upon the likely fact that casual inoculation in open places, where sunlight vitiates the strength of the organism, likely produces an attenuated organism vaccination that explains much of the specific immunity known to exist in the body fluids in such a large portion of the population of civilized areas.

In retrospect it is easy to see that much was accomplished by our early exhibits, featuring tuberculosis. They attracted large crowds and stimulated the interest of a great number of voluntary workers that did much to bring about favorable legislation and inaugurate the various movements that led to regional sanatoria, the employment of visiting nurses, the development of diagnostic clinics, and the other agencies now so well known. Not a few of the early local anti-tuberculosis societies formed have since disbanded, realizing that their work has been taken over fully and effectively by local health boards or those connected with county sanatoria. In fact, it is easy to see that other matters of grave interest, not excluding the studies in psychology, have taken up the attention of an intelligent segment of many of our localities, who would be more or less bored if the original though successful primary campaign against tuberculosis was continued in the same manner and with the same instruments. These changes, instead of being an evidence of early failure, have rather been an indication of the gradual attainment of the objective sought. The Minnesota Public Health Association, in greatly enlarging its scope of work, and including much effort particularly among children, has certainly made no mistake, and these departures are to be commended and encouraged for the future.

A statistical study, based upon Minnesota records, and attempted by the writer at this time, has seemed to reflect only dimly the real success of the campaign. It is well known to all of you that the general death rate of about 200 per 100,000 of population in the United States, at or about the year 1900, has been reduced to about 100 per 100,000 at the present time. This means the saving of a hundred thousand lives in the United States yearly. According to the impression of close students of statistics, such as E. I. Lubin, this decreasing death rate will mean only one-fourth as many deaths in 1930 as there were in 1900. It begins to look, therefore, that the slogan, "No tuberculosis in 1950," may not seem impossible. In determining how we may continue to decrease the incidence of tuberculosis, we naturally fall upon the expedient of attempting an analysis of the factors involved in the known amelioration up to date. Only a few of these will be touched upon, including such matters as the virulence of the tubercle bacillus, the general resistance of our population, the influence of immigration, education, and our general standards of living. We should consider more fully just the type, size and general utility of our various sanatoria, upon which we know the greatest burden in our fight is still to rest. It must be fully apparent to those who have given the matter study, that the entire burden of the fight, however, cannot be left upon the shoulders of those conducting these institutions; it is the belief of Dr. Robinson Bosworth and of many others who are familiar with the situation, that we cannot abandon certain phases of "properly supervised home treatment." These, and many other factors, present themselves, but time will not permit their analysis.

THE PRESENT VIRULENCE OF THE TUBERCLE BACILLUS

There is an intimation that the bacillus tuberculosis, like bacillus lepra, is losing some of its virulence. This possibility can be briefly disposed of by considering the present morbidity and mortality from tuberculosis in known areas of Central Europe where careful observations have been made. The recent visit to this country of the well known pediatrician Finklestein brings to us the definite observation of a most careful man, that the increased incidence of tuberculosis in Germany has gone hand in hand with a reduction in the amount and quality of food known to be so essential to the young. This is known to be a war heritage wherever starvation is mercilessly persisting. It is even possible that this kind of temporary starvation may have a more vicious influence upon a people than the type of chronic and persistent starvation as is witnessed more or less constantly in Mexico. In that unhappy country, where a traveler notes, "Twelve

millions of them are forced at war times to go half starved, and in peace times are always underfed," it is even possible that a degree of hardiness encompasses the survivors, reducing the ordinary influence of malnutrition. This is not the case in a country like Germany, where the best of public health and disease prevention obtained and the economic structure of the land was very cohesive. Hence a debacle such as now is present submits its population to a scale of living and nutrition that gives their natural immunity little chance. This thought would need far greater amplification, but I am sure that the supposed predisposition to tuberculosis of the Irish race as a whole was acquired from the experience of those hordes of Irish immigrants who came to America after the famine of 1840 to 1850. The Irish children that survived that unnecessary blight and were the parents of the next generation of Irish-Americans were the unhappy folks who gave to my own race a good name in fighting everything except tuberculosis. It wasn't the fault of the race, but the dastardly potato that refused to grow, aided by the cupidity of blundering English landlords.

THE RESISTANCE OF OUR PEOPLE

It is likely that every epoch in history has fancied that the standard of living attained has been so far out of proportion to that previously obtaining that grave fears were held as to whether it might be continued or sustained. As far as the question of feeding and resistance is concerned, it would seem difficult to ever produce a situation where fewer people were necessarily subjected to undernutrition than in expanding America. No doubt as population increases and the strife of existence becomes more onerous, we also will arrive at some such situations as have recently come to pass in countries even as well organized as England, particularly where economic stresses attendant upon unemployment arise. In fact, many observers, instead of fearing that our people are to suffer from undernutrition, rather fear a wholesale tendency to obesity and hyperpiesis, with resultant degenerative diseases hastened by too rich and too high living, and too little physical exercise!

As far as we are concerned as physicians, the obvious need is shown for us to continue our interest in everything that will keep our people properly employed, with suitable hours of working, and with a stability of existence based upon a fair and equitable relationship between the forces controlling our national resources and developing our industries. This, in a word, calls for an intelligent interest on the part of all physicians in our civic and political growth. We are possibly inclined by nature or by social environment to constantly feel a suspicion of those striving for better hours of labor or higher wages, but it is manifestly to the advantage of general health conditions if the great force of working people not only in our cities but on our farms are prosperous and contented. It is our duty to work insofar as we can, as individuals and citizens, to bring such states about.

PROBLEMS OF IMMIGRATION

It is doubtful whether those who have recently drafted the immigration law have had in mind the possibility of temporarily shutting out from our shores those who have been recently subjected to the vicissitudes of malnutrition and starvation. While it may seem a turning of our back upon the older idea that our shores should be the haven of all those distressed, either mentally or physically, it must be clear at the present time that there are in large areas of Europe just the type of underfed and stunted children who could well in the next two decades become strong prospective candidates for active tuberculosis. This may be additional reason why the present restriction of immigration is worth while.

THE TRUE VALUE OF EDUCATION

Education is always mentioned as one of the chief advantages of our so-called "institutional care." Let us ask, how and why? It is fortunate that education has an influence in the mass that is often by no means reflected in the individual. Many animals have been trained either to trap their fellows or put them to work: witness the falcon and the elephant. A fair sprinkling of mentally alert individuals at strategic points keep a horde of near morons reasonably employed. Hence, education has a reputation far out of proportion to its real worth. Education and intelligence are confused: the one may be acquired—the other is a birth asset, compared with which all the earthly bestowals of chance or fortune are as mists before the mounting sun—a cataclysmic realization, is it not, and one we are often too slow in arriving at! As a man is born so he dies. Years of education are as surely wasted on some humans as if Michael Angelo had done his heroic tracings in the sand. Those of you who have said so much about "teaching the patient how to live," should well ask yourselves the question, "Who among those I am treating are capable

of being taught?" This answer can certainly neither be easily nor lightly given. This problem can be more clearly seen, possibly, by simply noting that it is totally impossible at the present time to give our best and most successful treatment for diabetes to the patient who is incapable of being taught. It is certainly accepted that it is impossible to treat the unteachable patient with insulin. Much time would be saved in many of our institutions and clinics if a conscientious effort would be made to find out those tuberculous patients who are fundamentally incapable of being taught. Their future control could then be determined, with the addition of such coercive measures and such restraint as would safeguard others. The rest could often profit greatly by more intensive personal training, where more time was available for them. The campaign of general education is going along splendidly, and it is doubtful whether we could improve on it much at the present time.

THE FUTURE WORK OF OUR VARIOUS SANATORIA

It is difficult for those familiar with the work done by our sanatoria to minimize their importance in whatever success the anti-tuberculosis campaign has so far accomplished. It is likely that far too much of the burden involved has been forced upon them. Dr. Robinson Bosworth, of the State Tuberculosis Advisory Commission, has kindly provided for me the data relative to the development of our state and county institutions, and this is shown in the accompanying Chart I.

It will be noted that this list, with bed capacities, does not take into consideration certain well known private institutions and those beds that are available in conjunction with other public or private hospitals. It is likely that the number of such beds is going to increase as the rightful responsibility for the proper teaching of interns and nurses in the matter of the care of the tuberculous becomes more widely understood.

The data presented in Chart II, while incomplete and offering only a comparison between the beds discussed in Chart I, and the death rates as given by the State Board of Health, is nevertheless significant, because it is apparent that very soon, if not already, we have, in the institutions controlled

CHART I

Sanatorium	*Location*	*Date of Opening*	*Capacity*	*Increases*	
State Sanatorium	Ah-Gwah-Ching	Dec. 27, 1907	60	80	1910
				95	1911
				130	1913
				170	1914
				240	1915
				280	1918
				325	1923
Nopeming	Nopeming	May 22, 1912	50	225	
Otter Tail Co.	Battle Lake	Nov. 4, 1913	37	46	1915
Ramsey Co. Pavilion	St. Paul	Sept. 14, 1914	124	None	
Mineral Springs	Cannon Falls	Nov. 1915	34	40	1922
Sand Beach	Lake Park	Dec. 3, 1916	26	34	1921
Sunnyrest	Crookston	June 13, 1916	30	46	1921
Lake Julia	Puposky	June 12, 1916	27	48	1921
Riverside	Granite Falls	April 29, 1917	40	50	1920
S. W. Minnesota	Worthington	July 25, 1917	45	55	1921
Buena Vista	Wabasha	Feb. 1, 1917	20	None	
Oakland Park	Thief River Falls	Dec. 31, 1917	24	32	1922
Fair Oaks Lodge	Wadena	Fall, 1916	24	30	1922
Deerwood	Deerwood	Fall, 1916	24	None	
Glen Lake*	Oak Terrace	Jan. 4, 1916	73	100	1918
				190	1921
				262	1922

*500 capacity early summer of 1924.

Steele, Freeborn and Faribault Counties, opening 1925, probably.

by the State and County alone, a very close approximation of the same number of available beds for tuberculosis as the current yearly death rate. You will remember that this was a desideratum aimed at and only dimly hoped for in the earlier years of the anti-tuberculosis crusade.

CHART II

STATE AND COUNTY SANATORIUM BEDS AVAILABLE, AND AVERAGE FOR FIVE YEAR PERIODS FROM 1905 TO 1923, WITH DEATH RATE PER HUNDRED THOUSAND AND THE AVERAGE YEARLY DEATH RATE

	Average Beds Available	Average Death Rate Per 100,000 (All Forms)	Average Deaths For 5 Year Periods From Tuberculosis
1905 to 1910	70	106.4	2111.4
1910 to 1915	245	110.2	2368.8
1915 to 1920	627	102.09	2364.4
1920 to 1923	1100	77.76	1901.25

In the year 1921, 5,200 cases of tuberculosis were reported to the State Board of Health. In the same year there were 1,880 deaths. In 1922 the proportion was of 4,229 reports to 1,726 deaths from tuberculosis. Taking the year 1922, it will be noted that by multiplying the number of deaths by 2.5 we get a rough approximation of the number of cases reported. This is of particular interest because it was formerly much in vogue to state that for every death from tuberculosis there were five active cases preparing to die. Thus it would seem that in 1922 approximately one-half the cases were reported, which, all things being considered, is a rather fair attainment.

With a continued and successful fight, it would not appear, theoretically at least, that we should need any elaborate and marked extension in the number or size of our tuberculosis sanatoria. There is a large educational value accruing from the distribution of institutions, regardless of size, in various strategic points within the state. There remains at the present time no very large area of our state that is not fairly well represented. When some of the southern and southwestern portions of the state are better covered, we may point with pride to a splendid equipment with which to still further arrest the ravages of tuberculosis.

Chart II furnishes no convincing evidence at the present time of any exact relationship between the decline in the death rate and the building and extension of our sanatoria. Insufficient time has elapsed. In general, those writing on this subject are prone to quote the statistics of New York City, not only on account of their striking figures but because they have had reliable vital statistics for a much longer period than most of us here in the west. Unofficially, however, it must be obvious that the present generation of children in Minnesota has been enormously safeguarded and protected by the fighting forces distributed and linked up within our state through our sanatoria. It is my belief that whatever development may come in the future, we should hold rigidly to keeping our tuberculosis clinics and our tuberculosis visiting nurses in the closest touch, if not under the same control, with our institutions. Our goal must be to have accurate registration within our district of every known active consumptive, and there is no better place for the assembling of this information than in our sanatoria. The information there collected may be freely transferred to the various health boards and to the state board of health, but the actual control, direction, guidance and supervision is obviously not so much an administrative problem as it is a personal one. Where this cannot be carried out by the patient's own physician, the nurses in connection with the tuberculosis clinics, and the doctors in connection therewith, and the institutions in which most of these patients have spent more or less time, are those best able to provide this needful and necessarily diplomatic oversight.

Dr. Lawrason Brown indicated for the American Sanatorium Association in 1920 the following standard:

"In order to qualify as a Class 'A' institution a sanatorium must have a resident physician and assistant resident physicians, one for every fifty patients up to one hundred and fifty, and then one for every seventy-five."

These quotations are simply introduced at this time to indicate that the problem before our sanatoria is something very different from simple housing. It is evident that a variety of situations is arising, and special extensions of treatment, such that no institution can afford to be without such vital and necessary hospital adjuncts as well equipped operating rooms and the best and most modern roentgen laboratories, and, if any worthwhile research is to be done, well equipped and manned pathological laboratories. Compression of the lungs, either by artificial pneumothorax or by extrapleural thoracoplasties, must be done in suitable

cases, and much of this requires not only a well balanced hospital staff but also such consulting staff appointments, that the various surgical and medical specialists needed for the proper conduct of medical treatment in an up-to-date manner will be available.

This suggests the inadvisability of the further development of small institutions needing such elaborate staffs and finding it difficult if not impossible to have them. It may even be essential in time to work out a system of co-operation and transfer between institutions, whereby those equipped for more intensive therapeutic endeavors may have an opportunity to focus upon those patients which time and experience will indicate may profit greatly thereby; some of the others might continue to carry out the less elaborate procedures.

It is increasingly more evident that even such simple procedures as the application of heliotherapy, Alpine light, ordinary sunlight, cannot be done in a hit-or-miss manner, but must be conscientiously and carefully supervised by those who know what they are doing.

It is useless for those in control of tuberculosis sanatoria to figure how a few dollars may be saved in their conduct. The monthly reports furnished by these institutions clearly indicate that the cost is now and always has been kept well within the average for our entire country. At the same time, it is never going to prove ultimately economical, and certainly not effectual, if we are to further depress our tuberculosis death rate, if the men who are willing to give their time and life work to these institutions are not properly compensated with reasonable salaries and given the equipment to work with. Let us look for a broadening of the scope of therapy within our institutions, and let us back the men up who are to bring this about. Let those of us outside the institution be willing and eager to furnish any and all consulting aid that is essential. By this harmonious co-ordination the effective work will go on.

GENERAL PRACTITIONERS OF MEDICINE MUST AGAIN BECOME INTERESTED IN TREATING PULMONARY TUBERCULOSIS

The whole problem of the care of these patients would be greatly simplified if the disease were not so wretchedly chronic, and, like typhoid fever, either yielded a reasonably prompt mortality or a recovery, accompanied by enough physical endurance to re-engage in ordinary occupations. It is well known that many tuberculous patients neither get well nor die, but remain "status quo."

Dr. A. T. Laird, of Nopeming Sanatorium, has furnished the following data:

Between the years May, 1912, and May, 1924, 1,909 patients have been discharged from Nopeming Sanatorium. In tracing these it is known that 1,073 have died; 209 have moved away from the county; 408 are not to be found; 112 are said to be non-tuberculous. This leaves a grand total still living within our county of 407.

As to the present number of tubercle bacilli producers known to live within our county, the following table is instructive:

	Positive Sputum	Negative Sputum	Total
Patients now at Nopeming.	105	91	196
Former Nopeming patients	127	280	407
Reported from other sources	174	488	662
Total	406	859	1,265

Recently Dr. Robinson Bosworth and Dr. A. T. Laird have been co-operating in an attempt to evolve a plan whereby our institutional beds might be the more effectively utilized for the active treatment of those cases of tuberculosis that are likely to yield the maximum of results. It is surmised that there must be a fair number of patients of such intellectual capacity and of such physical and pathological status, as to be able, under proper supervision of visiting nurses and their home doctors, to utilize to a considerable degree "properly supervised home treatment." Dr. A. T. Laird has appeared before our St. Louis County Medical Society, and has instilled a considerable amount of enthusiasm into the members who heard him, relative to a plan to bring them into closer co-operation with his staff, with our tuberculosis clinics, and the various nurses in the field. There is presently a distinct danger of the various organizations at work "to pass the buck from one to another." It is my contention that as far as the average private physician is concerned, he has passed up almost entirely the matter of the treatment of the tuberculosis patient, and expects the sanatorium to look out for him indefinitely. This is fortunately as illogical as it is unnecessary. The same complaint has been made relative to our insane asylums and institutions for the feeble-minded, and on the whole is a reflection upon the sincerity of our fellow prac-

titioners who present an agonized protest to any suggestion of instituting various grades of "state medicine." Nevertheless this considerable segment of practice is abandoned, and the doctors furthering this plan are sincere in the belief that many well trained patients will be perfectly willing to employ their home physician and pay him for his services, *provided he shows enough interest to familiarize himself with the principles involved and proceed along with the patient in the attainment of his cure.* We may again here utilize the example of diabetes: for a patient who has had good training in dietary control of diabetes to consult a physician who is totally unversed in caloric values and manipulation is to destroy at once all confidence in the physician's advice and judgment. No matter how distasteful the *teaching features* of our professional function may be, we cannot avoid them.

It is to be hoped in our county that an increasing number of men will avail themselves of Dr. Laird's invitation to come to Nopeming, take part in clinical conferences, and become familiar in an intimate way with the actual detail of modern tuberculosis therapy. It is certain that in recent years the application of the cardinal principles of rest, food, fresh air, and, presently, heliotherapy, have been advised in an altogether too general manner; too much of the idea, "Be good and you will be happy." What is needed is some of the same intelligent application of correct principles in private practice as is now seen in our special clinics and hospitals.

Granting, however, the limits of instruction to which our kindly but busy confrères will submit, it must be convincingly evident that a very great field presents itself for the better instruction of our medical students and interns who are to be the active practitioners of the next two decades.

Dr. D. A. Stewart, the well known tuberculosis authority and medical director of Ninette Sanatorium, Manitoba, has done particularly good pioneer work in the matter of utilizing medical students sent on from Winnipeg "for one month's residence at the sanatorium—an official part of their medical course." This has been done to a limited degree by our own state university, but our various sanatoria should arrange so that every graduating student might have at least a month or possibly more.

Interns graduating from our hospitals, with their final year of clinical work, should have their courses so arranged that part of that time might be spent in direct contact with those constantly teaching and directing this work. It would seem that very little effort is now needed to bring this about.

THE ACTUAL SUPERVISION OF EVERY KNOWN POSITIVE SPUTUM CASE

Finally, it must be quite evident that if every positive sputum case were under such supervision and control as to give him such surroundings as to make unlikely the infection of others, the control of tuberculosis should be just as sure as that of yellow fever where the mosquitoes are not allowed contact with the infected human. We would undoubtedly find that very few individuals securing this control would have it forced upon them unwillingly. Sanatorium trained physicians are always keen upon the feature of providing such opportunities for work and self sustenance as are hinted at in various "colonies" provided for that purpose. Even where this excellent development has not come about, have we not at the present time an extraordinary network of public health agencies with many visiting nurses in the field, all of whom could be readily drawn into the plan, which has for its ultimate intention, as far as tuberculosis is concerned, *to place a hypothetical cordon about the positive sputum case, rendering it easy for him to do his obvious duty in safeguarding his fellowmen?* The work necessary to bring about this next vital step is one of the most engaging problems before us.

THE DECLINE IN TUBERCULOSIS AS REVEALED BY POST-MORTEM EXAMINATIONS*

H. E. ROBERTSON, M.D.
Section on Pathologic Anatomy, Mayo Clinic
Rochester, Minnesota

During the six thousand years of written records of human events, accounts of devastating epidemics have appeared with steadily increasing regularity, and, on many occasions, with appalling results. No one single class of historical data rests on such certain foundations as the essential facts concerning these epidemics, which begin, often at accurately determined periods, increase in severity with varying degrees of rapidity until the high peak of incidence is reached, and then wane, gradually fading out into the unrecorded level of the ordinary ills and accidents which constantly afflict the human race. As the art of writing became more widespread, the waves of these epidemics could be traced with increasing accuracy to neighboring peoples along the lines of human communication, sometimes spreading with almost incredible rapidity, but always repeating the cycle of development and regression which is the predominant characteristic of all major plagues.

With the increasing complexity of international relations, the course of minor or more chronic epidemic diseases becomes increasingly difficult to trace, and only those with rapid rises, high percentages of afflicted persons and severe results, may be carefully studied as major events in history. Consequently we become prone to regard an "epidemic" as a disease that comes on fairly rapidly, reaches a clearly perceptible crest, works horrible havoc and then disappears.

In the earlier instances of such epidemics, ignorance with respect to their cause or manner of spreading, and the awful, irresistible onward march of the destructive "thing," in short, the universal mysteriousness of the whole process, justified the conclusion that only the gods or devils could have produced such absolutely inexplicable results. It was not until the latter part of the last century when the parasitic nature of most of these diseases was demonstrated, that rational study of them became possible, although it cannot be too strongly emphasized that the essential facts with respect to their cyclic manner of occurrence had been indisputably established long before any clear conceptions of their cause had been reached.

However, it must be admitted that, with the exception of their wave-like tendencies and certain well established clinical and pathologic characters, the real nature of most epidemic, and many endemic, diseases only became known when the microscope, the culture tube, and experiments with laboratory animals revealed the true relation between invaded host and invading parasite, and that, in the short period of the last forty years, more knowledge about the behavior of host and parasite has been gained than in the entire thousands of preceding years. We now know that every form of animal and vegetable life suffers from pests and pestilences; the preyer is preyed upon, and the extent of the battle of all living matter against the so-called natural forces of earth, air and water is readily comparable with, and perhaps exceeded by, the importance of the struggle against living foes of every conceivable variety and form and every possible degree of destructive power.

With this intensely rapid accumulation of facts concerning parasitology in its broadest sense, and the "close up" study which we now give to the habits of the contending agents, the salient points brought out by historical studies are likely to be ignored. We tend to disregard the past because of the partial ignorance which it so plainly exhibited, and we often appear to date history, with respect to disease at least, from a comparatively recent period. The complete acceptance of such an attitude will inevitably deprive us of a certain useful understanding about the natural laws of epidemics, which can only be gained by the consideration of diseases, not in terms of days, months or years, but of decades, generations or even centuries. Only when this historical background, reinforced by our present knowledge, is given full recognition, will some of the still numerous, unexplained puzzles concerning the evolution of parasitic disease receive a satisfactory solution.

The first fact that becomes pertinent in this connection is the ever-changing relation between all hosts and all disease-producing parasites. While the individual struggle between the lives of these contending forces may sway from side to side, now the host and now the parasite attaining the ascendancy, ultimately every such contest must end with the death of one or the other of the contestants.

*Read before the National Tuberculosis Association, Atlanta, Georgia, May, 1924.

No other solution is possible. In any single contest many factors may unite to give victory to either side; in epidemics, on the contrary, at least those attacking man, at first a group victory is achieved by the invading organism, but later, and always up to the present time, the host, as a group, has ultimately cast off the parasite and become temporarily, as a species, relatively immune and inimical to its efforts to live and do harm.

This cycle of events is so strongly evidenced in world-wide or local epidemics of acute diseases that we expect it, and we believe that this curve of evolution, including subsidence, must perforce occur even if we give little thought to the reasons for such a belief. These reasons, however, may be largely based on a study of the historical aspects of such diseases, sufficient periods of time having elapsed to enable us to view entire epidemics as entities, and to survey enough recurrences of the phenomena to enable us to establish fairly well definite laws concerning their behavior.

While the wave character of acute contagious diseases seems to be a firmly grounded principle, the same tendency with respect to more chronic or widespread affections is either not recognized at all, or the application of this law is wholly denied. This mental attitude is, of course, unreasonable and also unreasoning. Disease cycles may be very long, they may even, although probably rarely, take centuries to finish their course, but in the end the wave *must* finish its rise and inevitable fall, and the particular parasite as a group infection *must*, temporarily at least, cease to be a menace to its particular group host.

Of course, it is conceivable that the invading group might come off wholly victorious and the invaded host perish as a result. It is even conceivable that the human species may sometime be wiped out by some especially harmful form of infecting agent. Such, however, is not the teaching of evolution, or (if the word should be taboo) of history. Our vision is, unhappily, extremely limited, but so far as it can pierce the veil of the future, relying on the knowledge of the past, to that extent, we can rest assured of the perpetuity of the human race or some species closely related and developed from it. This certainly holds so far as any struggle between living organisms is concerned, even if it does not obtain in the eternal struggle against the natural forces of the universe.

But whether the human race is ultimately to develop into a more complex species or is doomed to extinction, we are chiefly concerned at present with the hopes we may entertain of victory over certain of our more persistent parasitic enemies. Specifically stated, we wish to know what prospect the human race has of becoming free from the menace of smallpox, typhoid fever, measles, and the other acute infections, and whether there are any signs at present that the more chronic and hopeless sort of plagues, such as syphilis, leprosy and tuberculosis, will ever disappear.

As a general proposition, in view of the position just outlined, it can be confidently affirmed that, in the very nature of things, not only the acute contagions but also the chronic ones, if due to pathogenic organisms, must eventually entirely succumb in their struggle with man as a host. That new and more deadly parasites may take their places is not only possible but even probable, but that the particular diseases now afflicting man must run out their cycle to their own destruction seems as clear as any one fact in the history of the race. In Nature's laboratory there can be no such thing as a permanent parasitic disease.

The general argument might be easily developed in richer detail, with the citation of innumerable examples from both ancient and recent history, but my task is not now directly concerned with anything more than the bare outline of the thesis which has been mentioned. On the other hand, it is directly concerned with the evidence which may be found to show that, with the huge plague, tuberculosis, there are definite, seemingly unmistakable, signs that its menace is diminishing, and that as a pandemic the downward side of the cycle has been reached. Favoring this view, much general evidence gathered from comparison of mortality and morbidity statistics could be, and has been adduced, but I intend to confine myself to the evidence gathered at post-mortem examinations, and present facts which show a rather remarkable change in the reactions of the people of North America toward the bacillus of tuberculosis. In the routine conduct of post-mortem examinations, the lesions of tuberculosis are often among the most prominent, most easily identified, and least often overlooked. Consequently, statistics concerning them have a somewhat greater validity than many other and more obscure diseases. Hence, it is natural that all pathologists should be struck with the comparative frequency of various forms of tuberculous

infection, from the fulminating type of ulcerative pulmonary tuberculosis with pneumonia and generalized miliary distribution, to the tiny calcareous concretion in the peribronchial or other lymph nodes. So widespread has been the knowledge thus obtained by pathologists that the oft repeated statement that from 75 to 90 per cent of all civilized races show evidences after death of some sort of tuberculous infection is universally accepted. The character of these lesions has been described in rich detail, and all physicians, and many who are not physicians, have a fairly accurate conception of the manifold classes of reactions which occur between the virulent bacillus of tuberculosis and its often more virulent human host.

Our attention has thus been focused on the diagnosis, the effects and the treatment of the disease, and too few attempts have been made to detect or to measure the changes which must have occurred in the mass relations between the bacterial parasite and its human host. As has been previously emphasized, the word "must" is used advisedly. The plague is either increasing, at its peak, or on the downward side of the curve.

For the last two decades I have been deeply interested in the character and incidence of tuberculous lesions as revealed by examinations after death, and for the last five years I have received the general impression that a distinct and appreciable change is occurring in the relative percentages of the various types of the disease. This impression became so strong that I attempted to analyze a series of earlier cases and to compare them with other series of recent years. The results are shown in the accompanying tables.

In Table 1 the first column represents 250 complete post-mortem examinations from the records of the Pathologic Department of the Medical School of the University of Minnesota during the years 1908 to 1910 inclusive. These records were almost entirely made by me or under my direction, and represent coroner's cases, cases from the City and University Hospitals, and a small proportion from private practice. All partial examinations and those on infants under six years were excluded, but with these exceptions the cases were listed seriatim. They are divided into four groups: (1) cases in which there were no demonstrable tuberculous lesions or pleural adhesions, (2) cases in which there was pleural fibrosis, but no lesions, (3) cases in which there were old healed foci, and (4) cases in which either chronic or acute, but still active, tuberculosis was present. The second column is a similar tabulation of 250 cases from the records of the same department, made by my successor, Dr. E. T. Bell, or under his supervision during the period between October 22, 1923, and April 21, 1924.

The results are striking. They show an increase of nearly 10 per cent in cases free from evidences of tuberculosis or adhesions, and a decrease of over 20 per cent in cases of active tuberculosis. In the third column are grouped 1,000 cases by percentages collected from the records of the Mayo Clinic, and representing post-mortem examinations performed by me or under my direction during the years 1922 and 1923. A still more striking decrease is seen in cases of active tuberculosis. The increase in cases of healed tuberculosis represents the results of extremely careful search for tiny lesions in each case. It is almost as significant as the cases in which there were no lesions, inasmuch as the healed foci represent increased resistance on the part of the host, and decreased virulence of the bacteria, betokening a losing fight for the latter.

To clarify this point further these three series were analyzed as to age incidence, and the results

TABLE 1

THE DECLINE OF TUBERCULOSIS AS EVIDENCED BY POST MORTEM STATISTICS

	1908-1910 250 necropsies Per cent	1923-1924 250 necropsies Per cent	1922-1923* 1,000 necropsies Per cent
No evidence	30.0	39.2	20.1
Adhesions	26.4	44.0	12.4
Healed tuberculosis	16.0	10.4	63.0
Active tuberculosis	27.6	6.4	4.5

* Mayo Clinic series.

TABLE 2

AGE INCIDENCE *

	1908-1910 250 necropsies Per cent		1923-1924 250 necropsies Per cent		1922-1923** 1,000 necropsies Per cent	
Age, years	6 to 30	31 and over	6 to 30	31 and over	6 to 30	31 and over
Adhesions	13.63	86.36	12.73	87.27	13.71	86.29
Healed tuberculosis	20.0	80.0	15.38	84.62	8.57	91.43
Active tuberculosis	20.29	79.71	31.25	68.75	22.22	77.77

* Same cases as were used in Table 1.

** Mayo Clinic series.

given in Table 2. Each of the columns in Table 1 was divided into two age periods, the first six to thirty years, and the second thirty-one years and over. Of the 26.4 per cent of cases in the first column of Table 1 with adhesions, 20 per cent occurred in the first age group, and 80 per cent in the second. This is what one would expect, namely that adult life would be more largely represented in any list of general deaths. The most important point is revealed in the last two columns of Table 2. Here only 8.5 per cent of the patients with evidences of healed tuberculosis were under thirty years, and 91.4 per cent were over thirty. This means that the younger generations are acquiring a total immunity in far greater degree than the older generations. In fact, if healed lesions are found in a parent we have some grounds for assuring the son or daughter of a relatively increased immunity in themselves.

The figures given do not constitute conclusive proof. They are from a comparatively small series, and are not far enough separated in point of time. However, they are presented for what they may be worth, with the hope that more comprehensive and more detailed statistics may be gathered, and clearer evidence adduced concerning this important question.

Non-specific Protein Therapy.—The mechanism involved in non-specific therapy concerns cell stimulation. Weichardt assumes that this involves all cells. Other researches indicate that certain cell groups may be more particularly concerned. On stimulation, the cell becomes more permeable. Antibodies, enzymes, fibrinogen, etc., leave the cell. Under certain conditions a rapid destruction of organisms may take place to an extent that may overwhelm the patient by sudden liberation of toxic bacterial products. The first phase of the reaction corresponds in many ways to a parasympathetic effect. Later a second phase follows during which the patient is improved. This phase may exist for a considerable time and is clinically apparent in the improvement of the patient. No cases are reported in the literature in which chronic urticaria has been so treated although many related conditions on evident or probable sensitization have been improved (hay-fever, asthma, migraine, epilepsy, intermittent hydrarthrosis). Great caution must be used in the employment of the more active substances such as typhoid vaccine, peptone and collargol. Very small doses of relatively mild activity (tuberculin, casein, turpentine) are much more suitable. This has been the experience in chronic arthritis. The dosage must be adjusted to suit the patient, care being taken to keep the dose at all times just below that which causes a focal reaction at the site of the lesion. (Jour. A. M. A., June 7, 1924, p. 1883.)

FOREIGN BODIES IN THE ESOPHAGUS AND AIR PASSAGES*

PORTER P. VINSON, M.D.
Section on Medicine, Mayo Clinic
Rochester, Minnesota

On May 11, 1898, Dr. Algernon Coolidge, Jr., removed a portion of a tracheotomy tube from the right bronchus of a man by enlarging the tracheotomy wound, inserting a urethral speculum, and grasping the foreign body with alligator forceps under direct vision from a light reflected by an ordinary head mirror. This seems to be the first time that such a procedure was accomplished in this country. Since then many instances of the successful removal of foreign bodies from the food and air passages have been recorded in the literature, and, through the untiring efforts of Jackson, Mosher and many others,[1] peroral endoscopy has taken its place in the front ranks of technical surgical procedures. Because of the very technical nature of these cases, physicians have not given them much consideration, and it is my purpose to present some of the problems concerning this type of work.

Foreign bodies in the esophagus are less common than in the air passages. Coins, open safety pins, bones, partial or complete dentures, and fruit seeds of various types, may become lodged in the esophagus, but most small substances pass into the stomach without difficulty, and after entering the stomach almost all of them will have an uninterrupted passage through the gastro-intestinal tract. Often an open safety pin will pass through the entire alimentary tract of a very small child without producing the slightest discomfort. However, when one of these substances becomes impacted in the esophagus, it usually produces great discomfort, and occasionally death. At first there may be substernal discomfort with obstruction to the passage of solid food, and sometimes even of liquids. Pain on swallowing is commonly noted. If the patient strains very much to dislodge the foreign body, very early perforation may occur, with resulting mediastinitis and death.

Ulceration of the esophagus will result from the presence of almost any type of foreign body, and it is remarkable that the endoscopist rarely sees a

---

*Read before the Southern Minnesota Medical Association, Mankato, May 19, 1924.

foreign body that has been present in the esophagus for a long time. Stricture of the esophagus occurs rarely as a sequela even if there is considerable ulceration at the time the foreign body is removed.

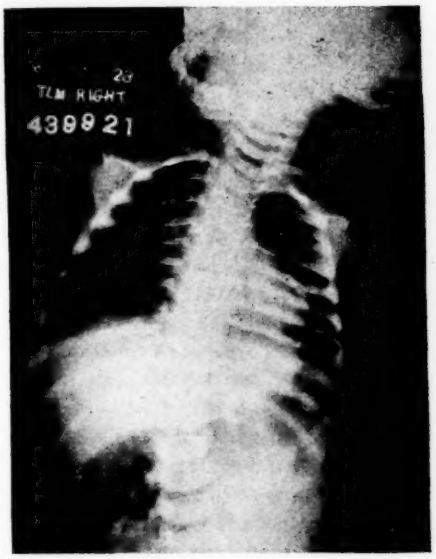

Fig. 1 (A439921). An open safety pin in the esophagus that later passed into the stomach and through the alimentary tract without inconvenience to the patient.

The diagnosis of a foreign body in the esophagus can be made on the history, the direct *x*-ray findings in case the foreign body is opaque to the ray, the indirect *x*-ray findings in case the foreign body is non-opaque to the ray, and esophagoscopy. The history is quite important, and one should always bear in mind the fact that many psycho-neurotic patients have a feeling of a "lump in the throat," and will sometimes swallow a substance that produces a slight trauma in the throat and gives the sensation of a foreign body. Such patients should not be esophagoscoped unless absolutely necessary, because the trauma incident to an esophagoscopy has a tendency to increase the discomfort. In the case of foreign substances not opaque to the *x*-ray, the cause of obstruction in the esophagus may be determined by the ingestion of a thick barium mixture, or a capsule filled with barium or bismuth, and fluoroscopic examination. With the esophagoscope, the foreign body can be definitely located and its removal is usually accomplished easily.

Foreign bodies are lodged in the air passages rather often, owing to the fact that any substance that enters the larynx will be aspirated, and unless coughed out, will remain in the trachea or one of the bronchi. Many foreign bodies are probably coughed out, but one is never justified in awaiting this method of removal. The practice of inverting the patient in an attempt to accomplish such a result should be discouraged, because a dislodged substance in the air passages may thus become impacted between the vocal chords, necessitating an immediate tracheotomy to prevent suffocation.

The symptoms of a foreign body in the air passages depend on its size, shape, composition, consistency and location. I shall not attempt to discuss the many problems involved in the diagnosis and localization of a foreign body that has been aspirated, but the combined efforts of the roentgenologist, internist, and bronchoscopist are often required.

Any child who develops an unexplained cough, with or without fever, should be suspected of harboring a foreign body in the air passages, and should have a most careful history and examination. Any patient, child or adult with a chronic pulmonary suppuration or pulmonary hemorrhage may have a foreign body in the air passages as the etiologic factor. In considering lung abscess and unilateral bronchiectasis, the presence of a foreign body should always be considered.

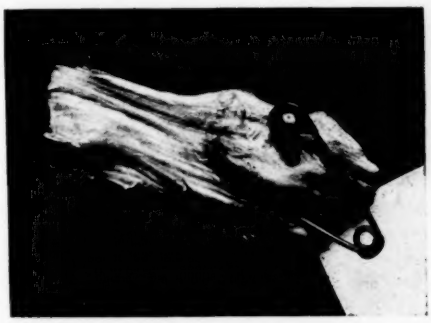

Fig. 2 (A455753). Ulceration caused by safety pin impacted in esophagus.

Many of the distressing results incident to the aspiration and swallowing of harmful foreign substances could be prevented by more careful oversight of children on the part of parents or attendants. This is particularly true with regard to the aspiration of peanut kernels. Small children

should not be allowed to eat nuts, particularly peanuts, as the symptoms caused by the inhalation of this type of foreign body are of a most fulminating character.

Although there are many cases of foreign bodies in the esophagus and air passages, there are hardly enough to permit the thorough training of many men for this type of work. Not more than two endoscopists to a community should be encouraged, and all cases should be referred to them so that they may perfect the technic that is so necessary

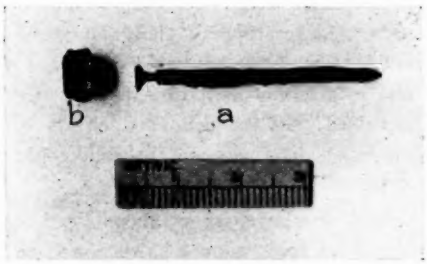

Fig. 3 (A457485). a. Nail removed from bronchus. Fever continued. b. Two weeks later, portion of oxidized metal coughed up by patient. Uneventful recovery.

in this exacting specialty. More than two specialists in this field divide the work so that none becomes expert, and the patient necessarily suffers.

BIBLIOGRAPHY

1. Greene, D. C.: Foreign bodies in the larynx, trachea and bronchi. Boston Med. and Surg. Jour., 1924, cxc, 626-628.

Exploiting the Cancer Sufferer.—The week of the annual session of the American Medical Association was chosen as a propitious time to resurrect two discredited cancer cures. A Philadelphia paper announced that the cause of cancer had been discovered and that a treatment had been evolved which was producing remarkable results. The publicity dealt with the alleged cancer serum of T. J. Glover of Toronto. This received some attention in 1921, but was not shown to be of value. The second "cancer cure" to be resurrected was that of Dr. Wm. F. Koch of Detroit. Koch's nostrum was brought to the attention of the newspapers of the country by one C. Everett Field. It received some attention in 1921, and was reported on unfavorably. The new publicity given to these two discredited "cures" is producing the usual effect. Sufferers from cancer both directly and through their physicians are frantically trying to learn whether there is any warrant for the claims so widely broadcast. (Jour. A. M. A., June 21, 1924, p. 2054.)

ETIOLOGY OF INTESTINAL OBSTRUCTION*

E. Mendelssohn Jones, M.D., F.A.C.S.
St. Paul

Intestinal obstruction is one of the most serious conditions with which the medical man is confronted, and in spite of the progress made in recent years, in medical science, it still presents many problems that are difficult to solve.

There are numerous factors that enter into the etiology of intestinal obstruction. There are a great many over which we have no control, but there are certain types of obstruction that occur following abdominal operations that can be eliminated if our patients are carefully prepared and we are careful in the handling of the viscera during the operation. There are some writers that believe that practically all cases of post-operative obstruction are preventable, but this view is undoubtedly too broad, for in the hands of the ablest operator, when the finest of technique is employed and the greatest of care is exercised in every respect, the fact still remains that post-operative intestinal obstruction does occasionally occur. Considering the number of abdominal sections that are performed it is striking to note the comparative rarity of post-operative ileus. It develops frequently in the most favorable cases, and at times one would least expect it, and therefore we must always be on the lookout for this complication as it is one condition above all others where every hour's delay is very costly to the patient.

I have divided the subject into four groups:

1. Cases in which the acute obstructive symptoms come on suddenly without previous symptoms;
2. Obstruction due to foreign bodies;
3. Obstruction due to tumors of the intestine, or growths outside the bowel;
4. Post-operative obstruction.

The first group I wish to consider includes the cases in which the acute obstructive symptoms come on suddenly without previous manifestations, as for example volvulus, intussusception, mesenteric thrombosis, strangulated hernia, or some form of obstruction due to a Meckel's diverticulum. De Quervain states that in most countries neither the student, nor surgeon, sees many instances of volvu-

*Presented in symposium on Intestinal Obstruction at St. Paul Clinic Week, January, 1924.

lus, but in Russia, especially in the Baltic states, it is the most frequent variety of obstruction brought into the hospital. Various explanations have been offered for this: the abundant dietary of potatoes or the greater length of the Russian intestine. These views are not accepted and it is much more likely that volvulus is due to a congenital or acquired abnormality in the mesentery, such as a long mesentery with a narrow attachment, thus affording the mesentery a more extensive movement. A volvulus may also be produced by the rotation of the ileum about its mesenteric border because of the lever action of a distended Meckel's diverticulum.

Intussusception may occur when an inverted diverticulum becomes invaginated into the ileum, forming a starting point for a progressive intussusception. An adherent Meckel's diverticulum may act the same as an adhesive band and cause strangulation of a loop or loops of intestine that might be caught beneath it.

When any of the external hernia, such as the inguinal, femoral, umbilical or ventral, become strangulated and the sac includes one or more loops of intestine, an acute ileus occurs. Forcible reduction of a hernia frequently leads to traumatism of the contents of the sac and adhesions occasionally result which may lead to the development of an obstruction. In this obvious type of hernia the solving of the problem is not as difficult as that presented by the strangulation of an internal hernia. Strangulation of an internal loop into a congenital peritoneal pouch is one of the rare causes of intestinal obstruction.

The principal forms of congenital internal hernia are: hernia at the foramen of Winslow, duodeno-jejunal hernia, hernia into the ileo-appendicular or retro-cecal pouch, and diaphragmatic hernia.

Embolism or thrombosis of the mesenteric vessels gives rise to a very fatal type of obstruction. It comes on suddenly and in its onset often resembles a paralytic ileus. The portion of bowel that has its circulation interfered with undergoes paralysis and this is rapidly followed by gangrene and peritonitis. Mesenteric embolism or thrombosis is apt to occur in cases suffering from valvular disease of the heart, or cases that have had an ulcerative endocarditis.

In the second group are the cases in which the occlusion of the bowel is due to a foreign body. The most common causes of this type of ileus are gallstones and fecoliths. Obstruction due to true fecoliths is not common. Fecoliths are formed by the deposit of earthy salts around some foreign body matrix such as a fruit stone or a large vegetable fragment. This type of mass may be found in the colon or the ileum. Gallstone ileus is not common when one considers the frequency of obstruction due to other causes. The most common mode of communication is through the formation of a gallbladder-duodenal fistula. The stone being too large to pass out through the ducts, sets up an irritation which continues until a localized peritonitis results, which naturally causes adhesions to form with the adjacent structures, most commonly the duodenum. The continual pressure of the stone then leads to a fistulous opening into the first or second portion of the duodenum. If a stone is less than one inch in diameter it usually passes through the intestinal canal without causing obstruction. Even though the mass is large enough to cause a complete obstruction, there usually are intervals during the attack in which there is a cessation of the severe symptoms. These are due to the stone, through some means, being dislodged and to the fact that it makes some progress in advancement. The quiescent period lasts until the stone is again arrested in its progress and the strong peristaltic action begins an effort to expel the foreign body. This phenomenon may occur several times before the stone reaches its final goal, either of impaction or spontaneous expulsion. The occlusion of the intestine is not only due to the size of the stone but also to a spasm of the circular muscular fibers of the intestine. At autopsy in these cases decubital ulcers are found in the intestine, indicating the different points at which the progress of the stone was checked. When the obstruction is complete the distention of the bowel causes a perforation of one or more of these ulcers and peritonitis follows. Early peritonitis accompanies gallstone ileus more frequently than obstruction from some other cause and it undoubtedly plays an important rôle in the mortality.

The third group of cases includes those in which the obstruction is due to tumors of the bowel or to occlusion of the gut by pressure from a growth outside the bowel. Tumors are found more often in the colon than in the small intestine. They may cause obstruction by blocking the intestinal canal or by causing a kink in the bowel. Not infre-

quently they are the primary cause of a volvulus or intussusception. The benign tumors that occur in this region include adenoma, fibroma, lipoma and myoma, and the malignant tumors are carcinoma and sarcoma.

Carcinoma is the most common malignant tumor found in the intestinal tract and occurs more often in the colon than in the small intestine. Malignant tumors cause obstruction more frequently than the benign growths. Tuberculosis of the intestine may give rise to a chronic incomplete obstruction and at any time an acute complete ileus may develop.

Interference with the lumen of the intestine due to pressure from a tumor outside the bowel does not usually occur until the tumor is obvious or palpable. In this group may be mentioned the retroverted pregnant uterus, enlarged spleen, tumors of the uterus, ovaries or mesentery. The obstruction usually occurs in the rectum, the sigmoid flexure, or the colon above the sigmoid.

The fourth group includes cases of post-operative obstruction. In this group the type that is perhaps as puzzling as any other is that of paralytic ileus. This is due to a paralytic distention of the bowel caused by undigested food contained in the intestine or to traumatism of the intestines or mesentery during the operation. It is also often associated with an acute local or general peritonitis or an acute pancreatitis.

Post-operative adhesions resulting in bands that constrict the intestine or adhesions that form in such a way that the intestine becomes kinked, account for the majority of post-operative obstructions. If a patient has had an abdominal section and signs of acute intestinal obstruction present themselves, in the majority of cases, a band will be found to have caused the obstruction. The question of post-operative adhesions is a most important one and if some one could tell us how to absolutely prevent them it would be a great contribution to the science of surgery, but as far as I have been able to ascertain no satisfactory solution has as yet been advanced. These adhesions may form bands that are circumscribed and cut off the intestinal lumen or, frequently following the freeing of inflammatory adhesions, loops of intestine again become adherent and because of the inflammatory reaction and associated edema an obstruction may develop. This type of ileus may follow operations on the gallbladder, stomach, intestines, pelvic organs, or simple separation of adhesions due to previous inflammatory diseases or operations. The surgeon has practically no control over the causative factor in this type of obstruction, but I wish to mention a few examples of post-operative ileus in which the surgeon does have the prevention in his own hands.

In doing a gastro-enterostomy an operator may not be careful in bringing up the loop of jejunum and in his manipulation this loop may become twisted, thus causing an interference with the intestinal lumen, and an obstruction results. Failure to suture the mesocolon to the stomach in doing a posterior gastro-enterostomy has often in the past been the cause of obstruction, as there is a tendency for the stomach to draw the jejunum upward through the opening in the mesocolon and strangulation of the loop of jejunum frequently follows. When performing an operation for suspension of the uterus in which the round ligaments are brought through the abdominal wall, great care should be exercised that no opening is left between the parietal peritoneum and that portion of the ligament between the internal ring and the point where the ligament is drawn into the abdominal wall. After the sutures have been placed, anchoring the ligaments to the fascia, one should again examine the ligament to be sure no space is left above the distal portion in the abdomen. Any opening at this point is a most favorable place for a loop or loops of intestine to enter and under various circumstances a strangulation may occur and an obstruction will result.

Not infrequently in dealing with the omentum it may be perforated in one or more places. It is obvious that such a condition invites trouble, as a loop or loops of intestine could very easily pass through one of these openings and one can readily conceive an intestinal obstruction as a result.

From these few examples it is evident that the surgeon must pay as much attention to the little things in surgery as he does the very evident major problems.

Intestinal obstruction is primarily a surgical condition, but since the successful therapeutic management of any disease is directly dependent upon the degree of familiarity with the etiological factors of the disease being treated, and since the internist is usually the first one that comes in contact with these cases, it behooves him as well as the surgeon to be thoroughly familiar with intestinal obstruction and its etiologic factors.

Van Buren, in a recent article on acute mechanical ileus, makes the following statement: "Subject to certain exceptions, it might be stated as a corollary that, if the case is really one of acute mechanical ileus, the longer the patient lives with it before operation the sooner he dies afterwards."

Dose of Thyroid for Children.—Thyroid effects are generally obtained by the administration of Dried Thyroid U. S. P. (Thyroideum Siccum). There is, however, no fixed dose of thyroid for children. The amount of dried thyroid to be administered must be determined in each case. A safe initial dose for a child three years of age would probably be 0.015 gm. of dried thyroids two or three times a day. The best way is to start with a small dose and to gradually increase it until either satisfactory improvement or symptoms of intolerance manifest themselves. As soon as the desired effects are obtained or symptoms of intolerance manifest themselves, the dosage must be reduced. (Jour. A. M. A., June 21, 1924, p. 2070.)

Therapeutic Lamps.—The Kromayer water-cooled mercury-quartz light and the Burdick and Hanovia mercury-quartz lights are considered sources of ultraviolet radiation of strong intensity, emitting a large quantity of long and short ultraviolet wave lengths. In contrast to this, carbon arc lamps, of which the ultra-sun lamp is an example, are used more particularly for the rays present similar to those in the spectrum of sunlight; namely, the invisible heat rays, the visible rays and the longer ultraviolet rays. The non-burning feature of the ultra-sun lamp is due to the practical absence or very weak intensity of the short ultraviolet rays which are the wave lengths that irritate and easily produce an erythema. The advertisers of the ultra-sun lamp stress the fact that the spectrum of their lamps is a continuous one, whereas the spectrum of the mercury-quartz light has gaps. No one has yet proved, however, that the presence of gaps in a spectrum is a drawback in the clinical use of that light. Furthermore, no one has proved that the burning or erythema-producing rays of the mercury-quartz lights are disadvantageous. It cannot be said that the carbon arc lamp is less valuable than the mercury quartz lamp for certain diseases. The exact indications for the different sources of light have not been worked out. (Jour. A. M. A., June 28, 1924, p. 2138.)

Vehicles for Prescriptions.—The following is a list of vehicles that can be used to prepare pleasant tasting mixtures: Aqueous Elixir of Glycyrrhiza N. F., Compound Elixir of Cardamom N. F., Compound Elixir of Almond N. F., Compound Elixir of Vanillin N. F., Glycerinated Elixir of Gentian N. F., Elixir of Anise N. F., Red Aromatic Elixir N. F., and Compound Syrup of Asarum N. F. The formulas of these preparations may be found in the Epitome of the U. S. Pharmacopeia and National Formulary, published by the American Medical Association. (Jour. A. M. A., June 28, 1924, p. 2138.)

SURGICAL DIFFERENTIAL DIAGNOSIS OF ACUTE INTESTINAL OBSTRUCTION*

F. J. PLONDKE, M.D.
St. Paul

The course of acute intestinal obstruction is rapid; if unrelieved the mortality is 100 per cent. When it has reached the stage of easy recognition the case is often hopeless.

I believe that I speak for every surgeon when I say that we would infinitely rather meet in consultation the practitioner who, early in the case, contents himself with something having gone seriously wrong in the abdomen than the one who 48 hours later will give us an accurate description of what the operation (or post-mortem) will reveal.

The symptom complex of acute intestinal obstruction resembles very closely that of other conditions coming under the head of acute abdomen or abdominal crises. It is therefore not always easy to differentiate.

In attempting a differential diagnosis it is well to remember that pain resulting from a lesion of a viscus is felt, not in that viscus itself but is referred to the peripheral distribution of the spinal nerves arising from those segments of the cord with which that viscus is connected through its sympathetic nerve supply. So far as the alimentary canal is concerned, reflex pain from the stomach is referred to the region of the xiphoid cartilage and the umbilicus; that from the small intestine and appendix to the umbilical area, and that from the large intestine to the mid-hypogastric line. From the liver, gall-bladder, and bile ducts, pain is referred to the lower part of the epigastrium and also sometimes to the lower angle of the scapula.

All pain, therefore, that is felt in the early stages of an acute abdominal crisis is of this reflex character and is not localized to the situation of the viscus primarily at fault. Later, when the local inflammation has developed sufficiently to irritate the parietal peritoneum, the pain becomes localized at this point.

The number of conditions which might at some stage simulate intestinal obstruction are so numerous that it would be impossible in the time allotted to even hint at how they could be recognized either preoperative or post-mortem. The more common

*Presented in symposium on Intestinal Obstruction at St. Paul Clinic Week, January, 1924.

are general peritonitis, acute pancreatitis, acute appendicitis, acute perforation of gastric or duodenal ulcer, ruptured pyosalpinx, ruptured tubal pregnancy, torsion of pedicle of ovarian cyst, tabetic crises, thrombosis or embolus of the mesenteric vessels, gall-stone, renal and intestinal colic. The symptoms common to all are pain, shock and vomiting; all dependent on the same cause, namely, shock to the solar plexus. Since this group of symptoms appear in practically all acute abdominal crises they are of little value for differential diagnosis in the very early stage. "This initial stage of shock and accompanying symptoms, often transient, is usually followed by a period of reaction; a dangerous calm before a renewal of the storm—indeed, so dangerous that when prolonged by the indiscriminate administration of morphine it becomes a very pitfall in the way of correct diagnosis."

Approaching the subject in general, and from an angle somewhat different than the usual, one might classify the conditions from which intestinal obstruction must be differentiated and place them into groups, representing: I, Colics; II, Perforations; III, Inflammations; IV, Obstructions.

I. The colics are characterized by: (1) sudden onset of pain, (2) sudden cessation of pain, (3) tendency of the pain to recur. The pain in this group is usually referred to certain characteristic regions. In biliary colic it is felt in the epigastrium, radiating backwards to the angle of the right scapula and occasionally to the tip of the right shoulder. In renal colic the pain is felt, first in the loin, then shoots down to the groin, inner aspect of the thigh and testicle. Of marked diagnostic value in connection with the pain is increased frequency of micturition and blood in the urine. In intestinal colic pain is felt more or less all over the abdomen. Lead colic differs from other intestinal colics in that the pulse during the pain is retarded and the blue lines in the gums are present.

Tenderness of the abdomen is often present but in some cases, particularly intestinal colic, the pain is relieved by pressure. Muscular rigidity may occur in the colics but seldom is of the unyielding character found in the true involuntary rigidity. The patient is more restless than in other acute abdominal crises.

II. Perforations are characterized by: (1) sudden onset of pain, usually excruciating, (2) severity of the initial shock, (3) marked involuntary rigidity from the very first, (4) there may be signs of free gas in the abdomen.

III. Inflammation.

1. In this group the onset is less sudden than in the conditions already considered, and general symptoms of malaise may precede the crises by a few days. The pain never reaches its greatest intensity in the first few moments.

2. There may be a rise of temperature in the early stage, wherein this group differs from the others mentioned. The presence or absence of rise of temperature should not, however, influence one too much in drawing conclusions and should certainly never be waited for to complete the diagnosis.

3. There is often fairly early local tenderness (sometimes first detected in the rectum as in salpingitis and pelvic appendicitis).

4. Muscular rigidity of the involuntary type, absent at first, appears when the parietal peritoneum becomes affected.

5. Swelling may later appear in the region of the appendix, gall-bladder, Fallopian tubes, etc. These signs should never be waited for in suspected intestinal obstructions.

IV. Obstructions are characterized chiefly by: (1) the persistence of vomiting, (2) the cessation of the passage of flatus, (3) progressive abdominal distention. Involuntary muscular rigidity is absent and the pain and tenderness are usually distributed more or less over the entire abdomen. As the condition progresses there is extreme distention, fecal vomiting, restlessness, pinched expression, rapid and thready pulse with profound collapse. When this stage has been reached it can be mistaken for only one other condition and that the usual termination of obstruction—general peritonitis.

If the case before us can be placed in one of the above named groups, the problem of diagnosis is at once simplified. When, however, the symptoms are indefinite or overlap as in obstruction, or perforation developing into peritonitis, the clinical differentiation is more difficult and can be arrived at only by carefully excluding all other conditions for which it might be mistaken.

Comparing the outstanding symptoms of the pathologic conditions which most commonly simulate acute intestinal obstruction we find as follows:

In *peritonitis* there is usually a history of some acute abdominal affection. In the early stage the pain is more marked and more continuous. The

distention is more general. The abdomen is immobile, noiseless and more tense. Visible peristalsis is absent, vomiting is less persistent. There is usually a rise in temperature and the increase in pulse rate a little more gradual.

Acute pancreatitis usually occurs in obese patients having a history of previous gall-bladder trouble. Pain is in the epigastric region and is very severe. Sudden profound collapse with early pinched expression and cyanosis are somewhat characteristic, but a definite diagnosis before operation is difficult.

Acute appendicitis may closely resemble obstruction in the earliest stage but usually within the safety period there is a rise of temperature, leucocytosis, localized pain and rigidity. Vomiting is not so constant. Where there is early rupture and consequent spreading peritonitis with toxemia a differential diagnosis may be difficult.

Acute perforation of gastric or duodenal ulcer. History of previous digestive trouble. The initial pain is more sudden, severe, prostrating, and constant. Shock, evidenced by pallor, cold sweat and collapse, is more marked. Pain, dullness, and spasm is usually more marked on the right side. The patient refuses to be moved. This latter with the tense board-like abdomen is characteristic.

Biliary and renal colic, except in the very early stage, offer no particular signs or symptoms which would make a differential diagnosis difficult. The spasm and characteristic pains referred to definite regions help to confirm the diagnosis.

Ruptured tubal pregnancy. The menstrual history with that of sharp, sudden, stabbing pain in the lower abdomen, together with faintness and pallor, should make the diagnosis comparatively easy; vaginal examination should never be neglected.

Tabetic crisis is often very difficult to differentiate from obstruction, because a paralytic ileus may exist as a result of the tabes. The Argyll-Robertson pupil. Rhomberg sign and the absence of kneejerk and other reflexes should put one on his guard.

Torsion of pedicle of ovarian cyst. With a history of tumor, or if pelvic examination reveals a mass in the pelvis or lower abdomen, the diagnosis is less difficult. Without the evidence of tumor and the presence of vomiting, distention and constipation—the latter often due to pain and spasm—a definite diagnosis from obstruction may be impossible before operation.

Ruptured pyosalpinx presents few symptoms common to intestinal obstruction except the first sudden pain and a gradually developing peritonitis.

Thrombosis or embolus of mesenteric vessels usually results in gangrene of a segment of the bowel with consequent cessation of passage of its contents through the part affected. The symptoms, therefore, are those of acute ileus and the demand for immediate surgical interference is the same as in acute obstruction from other causes.

Notwithstanding the improvement in surgical technic, the death rate from acute intestinal obstruction, even with operation, is still frightfully high. No surgeon denies the advisability of operating at the earliest possible moment. Yet the records of every hospital are replete with tragic stories, something as follows:

Patient admitted 6 P. M., history of pains in the abdomen, and nausea during the day. Pain, now, quite severe at times. Orders by doctor over telephone, morphine gr. ¼ per hypo. 8 P. M., patient more comfortable; vomited mucus and bile. The nurse's record the following morning: Patient comfortable the first part of night. Restless after 2 A. M. Slept only in naps. Vomited at 4, again at 5:30; light brownish color. Patient complains of some pain and tightness across abdomen. At 9 A. M. the doctor finds patient fairly comfortable *just now.* Some general distention, slight tenderness over abdomen, not localized; temperature 98.6, pulse 92. No bowel movement or flatus; face has tired expression, lips slightly dry, tongue moist. Laboratory report: leucocytes, 8,000; hemoglobin, 70 per cent. Differential, negative. Urine, highly colored. Sugar, negative; albumin, trace. Slight trace of indican. Microscopic, negative; diagnosis (?). Possible intestinal obstruction. Doctors orders: pituitrin, followed by enema; warm applications to abdomen; gastric lavage if vomiting continues.

Nurse reports by telephone at 4 P. M., fair results from enema with some flatus (when pinned down she admits that the fair bowel movement consists of highly colored water). Patient relieved after enema, but rather restless for last two hours with colicky pains, sometimes quite severe. Vomited at 11 and 3, stomach washed out; large quantities of brownish fluid with strong odor. Relieved for short time. Patient does not look so well, slightly delirious.

At 5:30 P. M. the doctor finds a little more distention, diffuse, but more marked in region of stomach, suggesting acute dilatation. Face rather pale with worn-out expression; lips more dry and a suggestion of dryness of tongue. Leucocytes, 8,500. Urine, scant; albumin and indican, positive. Temperature, 98; pulse, 100. Diagnosis still in doubt, but condition more indicative of obstruction. The doctor imparts his suspicion to the relatives and hints at surgical interference. They in turn implore him to first try everything else possible and at least wait till morning. Here we are weighed in the balance and too often found wanting; we yield, and in a last effort a purgative is ordered. At 2 A. M. the nurse reports that the patient is suffering from severe griping pains, distention more marked, and vomitus-

are general peritonitis, acute pancreatitis, acute appendicitis, acute perforation of gastric or duodenal ulcer, ruptured pyosalpinx, ruptured tubal pregnancy, torsion of pedicle of ovarian cyst, tabetic crises, thrombosis or embolus of the mesenteric vessels, gall-stone, renal and intestinal colic. The symptoms common to all are pain, shock and vomiting; all dependent on the same cause, namely, shock to the solar plexus. Since this group of symptoms appear in practically all acute abdominal crises they are of little value for differential diagnosis in the very early stage. "This initial stage of shock and accompanying symptoms, often transient, is usually followed by a period of reaction; a dangerous calm before a renewal of the storm—indeed, so dangerous that when prolonged by the indiscriminate administration of morphine it becomes a very pitfall in the way of correct diagnosis."

Approaching the subject in general, and from an angle somewhat different than the usual, one might classify the conditions from which intestinal obstruction must be differentiated and place them into groups, representing: I, Colics; II, Perforations; III, Inflammations; IV, Obstructions.

I. The colics are characterized by: (1) sudden onset of pain, (2) sudden cessation of pain, (3) tendency of the pain to recur. The pain in this group is usually referred to certain characteristic regions. In biliary colic it is felt in the epigastrium, radiating backwards to the angle of the right scapula and occasionally to the tip of the right shoulder. In renal colic the pain is felt, first in the loin, then shoots down to the groin, inner aspect of the thigh and testicle. Of marked diagnostic value in connection with the pain is increased frequency of micturition and blood in the urine. In intestinal colic pain is felt more or less all over the abdomen. Lead colic differs from other intestinal colics in that the pulse during the pain is retarded and the blue lines in the gums are present.

Tenderness of the abdomen is often present but in some cases, particularly intestinal colic, the pain is relieved by pressure. Muscular rigidity may occur in the colics but seldom is of the unyielding character found in the true involuntary rigidity. The patient is more restless than in other acute abdominal crises.

II. Perforations are characterized by: (1) sudden onset of pain, usually excruciating, (2) severity of the initial shock, (3) marked involuntary rigidity from the very first, (4) there may be signs of free gas in the abdomen.

III. Inflammation.

1. In this group the onset is less sudden than in the conditions already considered, and general symptoms of malaise may precede the crises by a few days. The pain never reaches its greatest intensity in the first few moments.

2. There may be a rise of temperature in the early stage, wherein this group differs from the others mentioned. The presence or absence of rise of temperature should not, however, influence one too much in drawing conclusions and should certainly never be waited for to complete the diagnosis.

3. There is often fairly early local tenderness (sometimes first detected in the rectum as in salpingitis and pelvic appendicitis).

4. Muscular rigidity of the involuntary type, absent at first, appears when the parietal peritoneum becomes affected.

5. Swelling may later appear in the region of the appendix, gall-bladder, Fallopian tubes, etc. These signs should never be waited for in suspected intestinal obstructions.

IV. Obstructions are characterized chiefly by: (1) the persistence of vomiting, (2) the cessation of the passage of flatus, (3) progressive abdominal distention. Involuntary muscular rigidity is absent and the pain and tenderness are usually distributed more or less over the entire abdomen. As the condition progresses there is extreme distention, fecal vomiting, restlessness, pinched expression, rapid and thready pulse with profound collapse. When this stage has been reached it can be mistaken for only one other condition and that the usual termination of obstruction—general peritonitis.

If the case before us can be placed in one of the above named groups, the problem of diagnosis is at once simplified. When, however, the symptoms are indefinite or overlap as in obstruction, or perforation developing into peritonitis, the clinical differentiation is more difficult and can be arrived at only by carefully excluding all other conditions for which it might be mistaken.

Comparing the outstanding symptoms of the pathologic conditions which most commonly simulate acute intestinal obstruction we find as follows:

In *peritonitis* there is usually a history of some acute abdominal affection. In the early stage the pain is more marked and more continuous. The

distention is more general. The abdomen is immobile, noiseless and more tense. Visible peristalsis is absent, vomiting is less persistent. There is usually a rise in temperature and the increase in pulse rate a little more gradual.

Acute pancreatitis usually occurs in obese patients having a history of previous gall-bladder trouble. Pain is in the epigastric region and is very severe. Sudden profound collapse with early pinched expression and cyanosis are somewhat characteristic, but a definite diagnosis before operation is difficult.

Acute appendicitis may closely resemble obstruction in the earliest stage but usually within the safety period there is a rise of temperature, leucocytosis, localized pain and rigidity. Vomiting is not so constant. Where there is early rupture and consequent spreading peritonitis with toxemia a differential diagnosis may be difficult.

Acute perforation of gastric or duodenal ulcer. History of previous digestive trouble. The initial pain is more sudden, severe, prostrating, and constant. Shock, evidenced by pallor, cold sweat and collapse, is more marked. Pain, dullness, and spasm is usually more marked on the right side. The patient refuses to be moved. This latter with the tense board-like abdomen is characteristic.

Biliary and renal colic, except in the very early stage, offer no particular signs or symptoms which would make a differential diagnosis difficult. The spasm and characteristic pains referred to definite regions help to confirm the diagnosis.

Ruptured tubal pregnancy. The menstrual history with that of sharp, sudden, stabbing pain in the lower abdomen, together with faintness and pallor, should make the diagnosis comparatively easy; vaginal examination should never be neglected.

Tabetic crisis is often very difficult to differentiate from obstruction, because a paralytic ileus may exist as a result of the tabes. The Argyll-Robertson pupil. Rhomberg sign and the absence of kneejerk and other reflexes should put one on his guard.

Torsion of pedicle of ovarian cyst. With a history of tumor, or if pelvic examination reveals a mass in the pelvis or lower abdomen, the diagnosis is less difficult. Without the evidence of tumor and the presence of vomiting, distention and constipation—the latter often due to pain and spasm—a definite diagnosis from obstruction may be impossible before operation.

Ruptured pyosalpinx presents few symptoms common to intestinal obstruction except the first sudden pain and a gradually developing peritonitis.

Thrombosis or embolus of mesenteric vessels usually results in gangrene of a segment of the bowel with consequent cessation of passage of its contents through the part affected. The symptoms, therefore, are those of acute ileus and the demand for immediate surgical interference is the same as in acute obstruction from other causes.

Notwithstanding the improvement in surgical technic, the death rate from acute intestinal obstruction, even with operation, is still frightfully high. No surgeon denies the advisability of operating at the earliest possible moment. Yet the records of every hospital are replete with tragic stories, something as follows:

Patient admitted 6 P. M., history of pains in the abdomen, and nausea during the day. Pain, now, quite severe at times. Orders by doctor over telephone, morphine gr. ¼ per hypo. 8 P. M., patient more comfortable; vomited mucus and bile. The nurse's record the following morning: Patient comfortable the first part of night. Restless after 2 A. M. Slept only in naps. Vomited at 4, again at 5:30; light brownish color. Patient complains of some pain and tightness across abdomen. At 9 A. M. the doctor finds patient fairly comfortable *just now.* Some general distention, slight tenderness over abdomen, not localized; temperature 98.6, pulse 92. No bowel movement or flatus; face has tired expression, lips slightly dry, tongue moist. Laboratory report: leucocytes, 8,000; hemoglobin, 70 per cent. Differential, negative. Urine, highly colored. Sugar, negative; albumin, trace. Slight trace of indican. Microscopic, negative; diagnosis (?). Possible intestinal obstruction. Doctors orders: pituitrin, followed by enema; warm applications to abdomen; gastric lavage if vomiting continues.

Nurse reports by telephone at 4 P. M., fair results from enema with some flatus (when pinned down she admits that the fair bowel movement consists of highly colored water). Patient relieved after enema, but rather restless for last two hours with colicky pains, sometimes quite severe. Vomited at 11 and 3, stomach washed out; large quantities of brownish fluid with strong odor. Relieved for short time. Patient does not look so well, slightly delirious.

At 5:30 P. M. the doctor finds a little more distention, diffuse, but more marked in region of stomach, suggesting acute dilatation. Face rather pale with worn-out expression; lips more dry and a suggestion of dryness of tongue. Leucocytes, 8,500. Urine, scant; albumin and indican, positive. Temperature, 98; pulse, 100. Diagnosis still in doubt, but condition more indicative of obstruction. The doctor imparts his suspicion to the relatives and hints at surgical interference. They in turn implore him to first try everything else possible and at least wait till morning. Here we are weighed in the balance and too often found wanting; we yield, and in a last effort a purgative is ordered. At 2 A. M. the nurse reports that the patient is suffering from severe griping pains, distention more marked, and vomitus-

dark brown, with foul odor; active delirium. The doctor hurries to the bedside, only to find the report of the nurse confirmed; by this time there is almost constant gulping of dark brown fluid with fecal odor, extreme distention, parched tongue, pinched expression, rapid and thready pulse, sub-normal temperature, cold sweat and extreme restlessness. The abdomen is immediately opened, only to find evidence of diffuse peritonitis, which the experienced surgeon at once recognizes as the beginning of the end.

A truly awful picture, and a terrible indictment against the profession, one to which most of us must plead guilty. We waited too long. We wanted to be sure, and while thus temporizing, the golden opportunity slipped away. Statistics complete the story.

We believe with Deaver, "that the reduction of the period between onset and operation is the prime factor. It cannot be too often repeated that during this period the essential point is *diagnosis* and not treatment. If treatment there must be at this time (and we are not blind to the fact that the physician feels the strong pressure of the patient and the family to be doing something), the physician should be sufficiently cognizant of the real issue and sufficiently resourceful not to be deluded or forced into doing that which will endanger the certainty of the diagnosis or unfavorably influence the course of the disease.

"The danger of giving morphia before arriving at a diagnosis is well understood and it is only the densely ignorant and the incorrigible who persist in this misuse of narcotics. The purge belongs in the same category since it is even more deathly than the opiate."

The problem of acute intestinal obstruction can only be solved by early diagnosis and prompt surgical interference. It is vastly more important that we recognize an acute surgical condition in the abdomen than to wait for evidence upon which to base a definite diagnosis of intestinal obstruction.

BIBLIOGRAPHY

Burgess, Arthur H. (quoted at length): The diagnosis of acute abdominal crises. Brit. Med. Jour., December 11, 1920.

Bottomley: Diseases and injuries of the jejuno-ileum and its mesentary. Ochsners Surgical Diagnosis and Treatment.

Deaver, John B.: The acute abdomen. Surg. Gyn. and Obst. Vol. 30, p. 30 (1919).

We do not know from whence ideas come, but the importance of the idea in medical research cannot be overestimated. From the nature of things, ideas do not come from prosperity, affluence and contentment, but rather from the blackness of despair, not in the bright lights of day nor the footlights glare, but rather in the quiet undisturbed hours of midnight, or early morning, when one can be alone to think. These are the grandest hours of all, when the imagination is allowed to run riot on the problem that blocks the progress of research, when the hewn stones of scientific fact are turned over and over, and fitted in so that the mosaic figure of truth, designed by mother nature long ago, be formed from the chaos.

In the medical literature of today, we have text books, scientific treatises, journals and magazines. One wonders if there is an end of knowledge. I fancy the pages that are covered with cancer literature, if spread out, would cover the state of Illinois. Yet, its solution is not at hand. I sometimes wonder if we are helped by too full a knowledge of medical literature. I must frankly confess that had I read all that was written on diabetes and known all of the conflicting views and theories I probably would never have tackled the problem.

The young man who devotes himself to medical research must familiarize himself with the first paragraph of Osler's "Alabama Student." It begins as follows:

"Chief among the hard sayings of the Gospel is the declaration, 'He that loveth father or mother or son or daughter more than Me is not worthy of Me.' Yet, the spirit that made possible its acceptance and which is responsible for Christianity as it is—or rather, perhaps, as it was—is the same which in all ages has compelled men to follow ideals, even at the sacrifice of the near and dear ones at home."

The man who wishes to make a success in research work must be prepared to work. He must sever his connections with labor unions that restrict the hours of his labor. He must be prepared to live, move, and have his being in the laboratory, eating and sleeping beside his work, if need be. Matrimony and research have seldom gone together. Very many brilliant young men have been overwhelmed by domestic responsibilities and have been lost to research. Here again it is well to quote Osler, "Put your affections in cold storage. * * * "

It knows no protective tariff, no embargo, no boundary line, to prevent its free dissemination for the good of all. At present it is the common language and common spirit among the nations. May I make bold to hope that American and Canadian science, depending as they do upon the efforts of individual minds, may harmoniously progress hand in hand, until that day is reached when they shall have contributed the maximum of good to the greatest number, and have brought the people at large to realize that science is the search for truth, that a true knowledge of God's creation dispels superstition, fear and disease, brings happiness, peace and prosperity, and leads to that humility with which the informed intelligence recognizes the omnipotence of the Creator.—*F. G. Banting address at the dedication of the Illinois Research Hospital, Chicago. The Institution Quarterly, Vol. xv, No. 1.*

MEDICAL CONDITIONS SIMULATING INTESTINAL OBSTRUCTION *

J. A. LEPAK, M.D.
St. Paul

When we advance the statement that medical conditions can simulate intestinal obstruction we immediately admit that intestinal obstruction can either be overlooked or diagnosed where it is not found. This is proven frequently enough when one sees occasionally a patient operated for obstruction where the surgeon does not find any, and again another patient treated medically where a bowel obstruction is discovered only at the post-mortem table. Naturally the question arises: Why do these errors occur? Is it always due to a lack of training, experience or poor medical or surgical judgment? No, it cannot be, because some of the most eminent medical and surgical authorities have made these mistakes. So it is. Why then is it so? The answer is simple. Intestinal obstruction is not always easy to diagnose.

In general these errors in diagnosis may be attributed to, first, the absence or variation, in some cases, of such symptoms as pain, shock, collapse, vomiting, constipation, distention, tenderness, visible peristalsis or tumor, known as the classical symptoms of intestinal obstruction; second, to the simulation of like symptoms by strictly medical conditions. It is natural then for the sake of clearness to divide the discussion into three groups.

The first deals with definitely surgical conditions; the second considers conditions medical at first, which, however, eventually become surgical; the third group embraces strictly medical conditions simulating intestinal obstruction.

Since the first group of conditions has been covered comprehensively in the preceding papers it shall be dismissed here with mere mention.

The next group comprises both surgical and medical conditions. The absence or variations of symptoms is so marked at first that a diagnosis of an underlying surgical condition is impossible; hence the patient, while under constant observation, is temporarily treated medically. This variation of symptoms is usually dependent on the height and completeness of obstruction. High bowel obstruction most commonly gives extreme pain, shock and vomiting; constipation and distention may appear later and visible peristalsis is usually absent. Low obstruction again generally produces slowly distention and constipation, pain is less severe and the shock may be very slight, while vomiting is either absent or occurs very late in the disease. The next factor adding to the confusion or variation of symptoms is completeness or incompleteness of bowel obstruction. In intussusception and mesenteric thrombosis or embolism incomplete obstruction may obtain and symptoms like constipation and distention may be absent or replaced by tenesmus and bloody stools. Thus simulation by Hanoch's purpura, cirrhosis of the liver, enteritis and colitis is possible. It has been demonstrated, however, that most of these cases suffer from either partial or chronic intestinal obstruction. Of course, these cases are surgical, but the operation is delayed because in the beginning a definite diagnosis of the underlying surgical condition cannot be established. To this group one may add also a few medical conditions which, failing to respond to medical treatment, demand surgical intervention. Such conditions are produced either by mechanical agents in the bowel or by functional paralysis of the intestine. The most frequent mechanical obstructions are due to fecal impaction, parasitic infestation and foreign bodies. Functional paralysis of the bowel may follow a severe injury to the testicle, ovary or hernial sac. It also may occur after a hemorrhoidal operation, abdominal paracentesis for large quantities of fluid, after passage of a renal and biliary calculus, and even rarely following operations not on abdominal viscera.

To the third group simulating intestinal obstruction belong strictly medical conditions demanding only medical treatment. The onset practically of any violently acute contagious or infectious disease must be considered. The onset occasionally of such diseases as Hanoch's purpura, enteritis, colitis, typhoid fever, and cholera may simulate intestinal obstruction. A severe pleurisy or pneumonia may produce, by its toxic products acting on the nervous mechanism of the bowel, a paralytic ileus. This usually is temporary and can nearly always be relieved by medical measures. Mannaberg and Osler, however, both record cases where an operation was necessary to relieve the paralytic obstruction. Uremia and poisoning from arsenic and lead may produce symptoms simulating bowel obstruction. One,

*Presented in symposium on Intestinal Obstruction at St. Paul Clinic Week, January, 1924.

of course, is endogenous, the other two exogenous in origin. A urinalysis will usually suffice to suggest further study of the case. A renal function and blood chemistry test with a blood pressure study will be confirmatory of kidney insufficiency. The occupation, lead line, and stippling of red blood cells are important factors in making a diagnosis of lead poisoning. Injuries or irritations to the nervous system, whether organic or functional, can also imitate symptoms and signs of ileus. One must, therefore, rule out any local injury to the peritoneum or omentum. Distant disease, again, e. g., in the thorax, may so irritate the sensory nerve segment that seemingly alarming symptoms are present mostly in the abdomen. The most frequent confusing of the spinal diseases is tabes dorsalis. An Argyll-Robinson pupil with absence of knee jerks usually makes one consider syphilis. Sometimes so-called functional neurosis, such as hysteria, adds to our confusion. A careful familial and personal history together with a superabundant and frequently dissociated number of symptoms places one at least on guard for possible neurosis.

CONCLUSIONS

1. Intestinal obstruction is not always easy to diagnose.

2. The examiner ought to group the possibilities into one of the following groups:

(*a*) Surgical and operate at once.

(*b*) Medical at first, but later surgical due either to an insufficient or seemingly incompatible number of findings to form in the beginning a surgical opinion, or to a definitely medical condition which, failing to respond to medical measures, must receive surgical intervention. The medical treatment in this group ought not to continue longer than twenty-four hours, because the surgical mortality bears a direct ratio to the delay of the operation. It is in this group that all medical and surgical authors agree with the statement, "when in doubt operate."

(*c*) The third group is strictly medical and yet when authors like Mannaberg and Osler each report seeing pneumonia, by its toxicity, producing a paralytic ileus which demanded surgical intervention, we can then appreciate properly how medical conditions can simulate intestinal obstruction.

THE CLASSIFICATION AND TREATMENT OF HEMORRHOIDS*

W. A. FANSLER, A.M., M.D.
Instructor in Surgery, University of Minnesota
Minneapolis

In the brief time assigned to this paper it is impossible to discuss all of the details and minor considerations incident to the many methods devised for the treatment of hemorrhoids. I merely hope to outline enough of the more important points to arouse some thought in this direction. The chief demand of the patient is that he be given a permanent cure and that he suffer as little pain as possible. In fact, pain is usually one of the chief considerations to him. It is quite possible to give him a permanent cure with practically no pain if we keep certain anatomical relations in mind and act accordingly. It will be recalled that almost all of the nerves of sensation of this region lie within the anal canal and that the rectum itself is almost insensible. It is this one point which enables us to care for these cases practically without pain. A minimum of trauma to the anal canal means a minimum of pain for the patient.

The most simple classification of hemorrhoids which I know is to divide them into two distinct varieties. First, the internal, which lie above the junction of the anal canal and the rectum and are covered by the velvety appearing, mucous-secreting, columnar type of epithelium. Second, the external variety which lie at the outer orifice of the anal canal, are covered by true skin and appear as a bluish swelling when the patient strains and the varicosities composing it are engorged with blood. At least half of the patients presenting themselves do not show either of these distinct types of lesion. More often than not a varicosity forming an internal hemorrhoid will extend downward into the anal canal thus forming an interno-anal hemorrhoid, or the varicosity of an external hemorrhoid may extend upward into the anal canal, thus forming an externo-anal hemorrhoid. Not infrequently the varicosity will extend from within the rectum downward, completely through the anal canal, joining with an external hemorrhoid below to form an interno-ano-external variety. This may seem to be an unnecessarily detailed description of a condition

*Presented before the Noonday meeting of the Hennepin County Medical Society, Wednesday, April 16, 1924.

so common as piles, but it is the recognition of these distinctions that enables us to cure them with little pain. Only too many cases are operated on the catch-as-catch-can principle, anything that is protruding being seized and burned or cut off without regard to its relation to the sensory nerve supply.

Whatever method may be decided upon it must be remembered that the anal and external varicosities must be considered as a separate condition from those inside the rectum. I believe that the two best methods of dealing with the anal and external varicosities are as follows: First, the method of excision, in which case the redundant portion of the overlying skin and mucous membrane is removed by sharp dissection and through this opening the varicosities carefully dissected out. The second method is to make a buttonhole incision at the base of the pile and inserting the blades of a pair of scissors through this opening macerate the varicosity, thoroughly destroying the vessels. This is done entirely subcutaneously and with care the skin is not cut except at the point of entrance. This leaves the anal canal intact and there being no raw surfaces the bowel movements are painless. Theoretically this method may not be quite as accurate as the first, but it is less painful and with experience the results are good. In connection with this type of hemorrhoid it is well to add that there are no vessels in the anal canal that it is necessary to ligate. This is a most important consideration for one ligature tied on anal tissue will cause the patient severe and prolonged pain. Only under most unusual circumstances should any ligatures or stitches be taken in this region and cauterization should never be done. If either ligatures or stitches are used pain is certain to result and should be expected.

The anal and external varicosities having been dealt with, the next consideration is the treatment of the internal hemorrhoids or true rectal varicosities which remain. Personally, I usually eliminate these either by the injection of a 5 per cent solution of quinine urea hydrochloride or by ligation; but I also wish to mention other methods and to point out their advantages or disadvantages. In many cases with the internal hemorrhoids there is a greater or less prolapse of the rectal mucous membrane and in choosing a method of cure this must be taken into consideration.

The clamp and cautery method is one of much repute in the Northwest. I can only attribute this to the fact that until very recently it was the usual operation done at the Mayo Clinic. Personally, I have never seen much excuse for this method. If the cauterization is confined to the rectum alone it is not painful, but usually some anal tissue is also included in the burn and then the patient's agony begins. As a matter of fact many who now profess to favor the clamp and cautery do not really do the clamp and cautery operation. They first dissect up the hemorrhoid and then applying the clamp around the shred of tissue left at its base announce that they have done a clamp and cautery operation. One reason advanced in favor of this method is that it is extremely simple and anyone can do it. If it is simply a question of seizing any protruding or bulging tissue with the pile clamp and then burning it off it is "simple." After the pain has subsided the resulting scar may produce relief if it does not produce a stricture. However, knowing the pain caused by a burn and the cicatrix and contractures resulting from it, I cannot feel that it is a very safe procedure to turn anyone but an expert loose in the rectum, with a pile clamp and a hot soldering iron. I have seen only one stricture following a ligation operation and I have seen many following clamp and cautery. Aside from the pain and granting that in the hands of an expert there is no danger of stricture, there is still another more important reason why to me this method is not good. I do not believe that it is humanly possible to do an accurate removal of all the varicosed veins with instruments as crude and clumsy as the clamp and cautery. Some varicosities are almost certain to be left and some healthy tissue sacrificed. Examinations of these cases after operation will prove this point in many instances.

What is really the result when the clamp and cautery is done and why is the percentage of apparent cures fairly high? In the first place several lines of cauterization are made along the long axis of the bowel. The scar produced by this binds the mucous membrane to the muscular coat of the bowel as in the case of linear cauterization for prolapse. This, of course, prevents protrusion and relieves the patient of this symptom. However, it does not prove that no piles are present; it only proves that they no longer protrude. If the rectum is inspected through a speculum large varicosities will often be seen clinging to one or both sides of these lines of scar, tethered in place like a toy balloon on the end of a stick. The scar prevents

their protrusion but they are there and likely to cause trouble later.

As has been previously stated, prolapse of the mucous membrane is present with many cases of hemorrhoids. As a matter of fact, many cases are treated as hemorrhoids, where the chief trouble present is really a prolapsus. In these cases a few varicosities appear to protrude through the anus and so hemorrhoids are diagnosed, but if more careful examination is made it will be seen that these varicosities are small. The major part of the protrusion is really a prolapsus of the mucous membrane which, in sliding down, has carried a few hemorrhoidal vessels with it. I would say off hand that fifty per cent of the persons complaining of hemorrhoids have this condition. Clamp and cautery does relieve this type of prolapse. If these cases are examined after operation all of the piles appear to have been removed, the reason being that there were really no piles present in the first place. If the cases which actually have large internal hemorrhoids were considered I believe practically all of them would show a considerable amount of hemorrhoidal tissue left after the clamp and cautery operation. Either this or a stricture would be present.

Another method of dealing with internal hemorrhoids is advanced by Dr. Murray of Duluth, who uses it on both internal and external type. This, as was previously described, is to make a buttonhole incision at the base of the pile, then with scissors to destroy subcutaneously the hemorrhoidal vessels. This is a useful method, but requires more experience to do well than open dissection with ligation. The inexperienced are likely not to destroy the vessels thoroughly enough. It is less painful than complete excision. In my opinion, it should not be used in cases associated with prolapse of the mucous membrane, which, as was previously stated, is quite comomn.

Method of injection.—In this case I use the injection of a 5 per cent quinine urea hydrochloride solution, based on the original work of Dr. Terrill of Richmond, Virginia. These injections are made at weekly intervals, using from 0.5 to 2 c.c. of solution. More than one injection to a hemorrhoid may be necessary. These injections are not very painful and have the advantage that the patient can work every day. The time of cure is usually from six to eight weeks, but this period can be shortened to two or three weeks if the patient can be quiet. This method may be employed even where there is some prolapse of the mucous membrane, for if a few injections of the fluid are made between the mucous and muscular coats as well as into the hemorrhoids, the reaction produced will cause scar tissue to form which binds the mucous and muscular coats together, thus curing the prolapse. I have previously described this procedure in a paper presented before the Southern Minnesota Medical Society. The danger of embolus, liver abscess, etc., is frequently mentioned as an argument against the injection method. I can only say that it never as yet has occurred in my experience, nor do I believe there is much danger if ordinary antiseptic precautions are observed. That they may occur if one is careless of his technique is quite possible. We all know of occasional deaths and other serious complications following operations for hemorrhoids, whether done by clamp and cautery, ligation or other methods. It may be possible that eventually some misfortune may attend a case where I have employed the injection method. Nevertheless I feel that the method is at least as safe as any other. Electrolysis may be used in the same cases where injection can be done and the same principles apply.

Ligation.—Where operative procedure is necessary or decided upon I feel that this is the method of choice. My preference for this is that all pathological tissues may be accurately dissected out and removed as cannot be done with the clamp and cautery. This applies whether simply hemorrhoids or hemorrhoids and prolapus exist. The external, anal and internal are all done with one dissection and it is relatively painless. There are two variations of the method which I think best. The first is to bring the internal hemorrhoid into view; then with a curved needle take a stitch at its upper pole. Tying this, the vessel supplying the hemorrhoid is cut off, and the procedure rendered almost bloodless. The ends of the ligature are left hanging and the lowermost part of the hemorrhoid seized and dissected upwards almost to the ligature and a tie then made around the stump. This method has the advantage of being almost bloodless, but the disadvantage of stitching through the rectum. This probably increases the danger of infection and often delays the separation of the ligature. The second method is to start the dissection at the lowermost part of the varicosity, carry it well up into the

rectum and then ligate. This method requires no stitch, but it is more bloody and unless the ligature is tied very close to the mucosa it may leave a little polyp-like tab of mucous membrane when the ligature separates. I usually leave the ligatures long, for by so doing they act to a certain extent as a wick, and, what is more important, it can be told when they have separated. If they are unusually slow, gentle traction each day will hasten their separation.

This paper is entirely a personal one and the synopsis of the various methods represents only my own convictions. I hope it will arouse interest in some of those present to continue to investigate problems in this connection. While we may not always agree, it is only by exchange of ideas that we progress.

RESTRICTIONS IN LICENSURE EXAMINATIONS TO THINGS THAT ARE SIGNIFICANT

Attention is again directed to the subject discussed by Dean Edsall in an article recently published in the *Bulletin.*

This article emphasizes particularly that state boards like medical schools are more concerned with the increasing of requirements, mainly as to the simple acquisition of facts rather than an intelligent contemplation of these facts, or the comprehension of the competent use of them.

There is an increasing tendency because of tradition and custom, both in teaching and licensure examination, to retain certain knowledge and facts that are obsolete and have long ceased to be of value.

There is no question that the medical curriculum, as well as qualifying examinations, have become extremely rigid in this country. It has been well said that there is less intellectual freedom in the medical course than in any other form of professional education. Individuality is submerged and there is little opportunity for developing individual responsibility.

It is time also that the quality of knowledge should take precedence over quantity, and this applies particularly to licensure examinations. This appeal from Dr. Edsall to examine only in the significant and important things is therefore very timely.

The state boards responded promptly to the general request that examination in materia medica, pharmacology and therapeutics be limited to the more important drugs. Why cannot this same principle be applied to the other subjects?

It is earnestly hoped that the Federation will offer its fullest co-operation so that this most desirable change in examination methods can be brought about.—*Federation Bulletin, Vol. X, No. 5.*

ETHYLENE ANESTHESIA: REPORT ON USE AT ANCKER HOSPITAL

J. Richards Aurelius, M.D.
St. Paul

Inspired by the results of the experimental and clinical work of A. B. Luckhardt and J. B. Carter of Chicago, and of W. E. Brown, of Toronto, pioneers in the recent development of ethylene anesthesia, we decided recently to give ethylene anesthesia a thorough trial at this hospital to determine whether or not it had a practical application in a hospital of this type, considered from both a clinical and financial standpoint. Since our first ethylene anesthetic we have used it to the exclusion of all other general anesthesia, except when several operations were scheduled simultaneously so that the ethylene apparatus was not available for all. We have made the following observations on 300 cases of ethylene anesthesia through a wide range in the field of minor and major surgery.

We desire here to express our indebtedness to Miss T. Zita Costello, R.N., anesthetist, and Dr. Carl Stomberg for their aid in the preparation of this report.

An analysis shows that of the three hundred cases, 194 were major surgical procedures, which included 12 cholecystectomies, 20 salpingectomies, 43 appendectomies (of which 27 included general peritonitis), 22 herniotomies, 8 hysterectomies, 3 thyroidectomies, 5 ectopic pregnancies, 3 thoracoplasties and 2 gastro-enterostomies. The minor surgical procedures were chiefly perineal repairs, curettements, abscesses, reduction of fractures, and the like.

The age limits varied from an infant of two months, with a sub-periosteal abscess (mastoid), to an adult male of seventy-seven years, who was anesthetized for implantation of radium needles. Fourteen cases were sixty years or over and thirteen cases were six years or younger. For both age extremes, ethylene anesthesia had no bad effects, but rather seemed an ideal anesthetic because of the ease and rapidity of induction, the quiet, undisturbed respiration, the regularity of the pulse during the anesthesia and the absence of any untoward post-operative symptoms such as shock, pulmonary involvement or severe vomiting. We have experienced nothing that would indicate that ethylene

anesthesia is anything but the safest and most desirable anesthesia at present available for the extreme age limits.

For the 300 cases, 208 hours of ethylene-oxygen gas were used, giving an average of forty-three minutes per case, with seven cases consuming more than two hours. In 40 of these cases, ether was used at some stage of the operation, sometimes to aid relaxation or during induction in cases where the patient was unduly excitable or unyielding.

The induction period for ethylene has averaged four and one-half minutes. A few cases required up to eight and ten minutes for induction, but when a longer period than this was consumed ether vapor was found to be necessary, as in two cases of general peritonitis. In practically all cases the induction has been quiet and free from struggling and talking. In some alcoholics and in some cases of severe peritoneal involvement, the induction was modified very much, making it necessary to add ether vapor. However, in many such cases, the patient was very slow to yield even with ether as an adjunct and this was generally true of all cases that did not yield promptly to ethylene.

We have found in the great majority of cases the relaxation has been very satisfactory for practically all major procedures. The relaxation is definitely more complete than with nitrous oxide, and less than with ether in some cases. In 40 of our cases we have used ether in some part of the operation and this has been necessary either during the induction or during severe peritoneal or mesentery manipulation. The ether used has varied from a few minutes up to fifteen. These cases were often relaxed only with great difficulty and sometimes unsatisfactorily, even when ether was added. We have been led to believe that the commercial ethylene varies or that certain impurities may be present in different cylinders because twice, upon using new tanks of ethylene, the relaxation was very poor in all cases using that gas, and upon replacing the cylinders for others no further trouble was experienced.

The recovery from the anesthetic has been uniformly prompt in all cases, even when ether has been used. The patient is oriented in one to two minutes and the length of the anesthesia does not seem to affect this prompt recovery. Just before awakening there is a vomiting reflex present which not infrequently causes the patient to regurgitate usually a mucous material. Sometimes there is definite vomiting while the patient is still on the operating table, but usually this does not occur after the patient has awakened from the anesthetic.

During the anesthesia the patient's skin remains remarkably dry, noticeable perspiration having been present in less than ten cases, and usually this has appeared during a strenuous induction period, as occurs in most alcoholics. The color remains normal, and in no case has there been cyanosis, regardless of how hard the anesthesia has been pushed, providing the minimum oxygen percentage necessary for respiration has been given. The sleep is very quiet, the respirations uniformly deep and regular, simulating exactly a normal sleep. Record of the pulse and respirations before, during, and after the operation have been kept as a part of the anesthesia record. The pulse and respirations before operation are those charted on the ward just before the patient is sent to the operating room. During the operation they are recorded about every five minutes, and following the operation they are again recorded as soon as the patient has awakened, before he leaves the operating room. In analyzing these records, we find the respiration rate was increased in 132 cases, an average of 3.8 respirations per minute, in all cases, and for those that had ethylene only (no ether), a rise of 2.8 respirations per minute. The respirations were decreased in 47 cases, an average of 2.8 respirations per minute or 2.5 for those patients who had no ether. The remaining 121 cases showed no respiratory change. The pulse in 150 cases was increased an average of 7.8 beats per minute or 5.7 beats in those cases where ethylene alone (no ether) was used. It was decreased 5.3 beats per minute in 97 cases, and for those cases that had ethylene only, a decrease of 5 beats per minute was shown, also a negligible difference. The remaining 53 cases showed no pulse changes. Therefore, we find that in ethylene anesthesia, including cases where a small amount of ether has been used, that there is a slight decrease or no change in the respiratory rate in 75 per cent of the cases, and in the other 25 per cent, the increase is only three to four respirations per minute; that the pulse remains the same or is decreased in 50 per cent of the cases and that in the other 50 per cent there is an increase of seven to eight beats per minute. When we exclude the patients who have had ether we find that there is practically no difference, the reason being that very little ether was used in any case.

We have been unable to take blood-pressure readings on all cases but those that have been taken have shown no appreciable change during or after the anesthetic. On a number of patients we have taken the clotting time before and during the anesthesia and here also we have not been able to demonstrate any change.

Following an operation in a patient who has not had premedication of morphine, we find that the patient complains of pain very soon and that morphine is usually necessary within fifteen to thirty minutes after return from the operating room. Patients who have had morphine previous to the operation do not complain of pain nearly as soon and often can go several hours before medication is necessary, but other conditions being equal, it is necessary to give medication for relief of pain considerably earlier in ethylene cases than in ether cases. Morphine premedication does not seem to have any effect on the course or ease of administration of the ethylene anesthesia.

The results from ethylene anesthesia from the standpoint of post-operative nausea and vomiting have, indeed, been very gratifying and we are likely to speak so favorably as to seem overenthusiastic. However, in comparing the period of our use of ethylene with a like period just prior to its use here, when ether and nitrous oxide were our anesthetics, we note a very appreciable lack of post-operative nausea and vomiting and an unusually uneventful convalescence of cases on all surgical services. Examination of records shows that there has been some vomiting after return from the operating room in 61 cases, sometimes only once and often very slight, and in only a few cases prolonged and severe. Twelve of these cases had ether during some part of the anesthetic. These cases include 6 cholecystectomies with appendectomies, 8 appendectomies, 5 salpingectomies, 3 ectopic pregnancies, 2 thyroidectomies, 3 hysterectomies, 3 curettages, 3 herniotomies, 3 pelvic abscesses with general peritonitis, 1 thoracoplasty, 1 nephrectomy and 1 orchiectomy. The severest and most prolonged vomiting has been noted in cases of severe shock, as in acute appendicitis with general peritonitis and as in one case of ectopic pregnancy, where the bleeding had been excessive and the patient was in considerable shock. In the gallbladder cases, the vomiting was most frequently present (six cases out of twelve), but not prolonged or excessive. Several patients had a definite psychic element present that unquestionably modified the post-operative course. These 61 cases do not include the cases that vomited while still on the operating table before awakening fully from the anesthetic. This has happened more frequently than the vomiting after leaving the operating room. This vomiting is probably due to the return of reflexes as the patient is awakening, as most commonly it consists of only a few contractions or attempts at vomiting, often producing only a bile-stained mucoid emesis. Very occasionally, this vomiting may be considerable in amount.

It is interesting to note that there has been very definite indication of inequality of the commercial ethylene, as stated before. We had two tanks at some considerable interval apart that seemed to be different from the usual ethylene in that the incidence of vomiting would be present successively and persistently until the cylinder being used was exchanged for a new one, when its occurrence would drop immediately to normal frequency. We have been unable to attribute the coincident difficulty of fully anesthetizing patients and the increased vomiting to anything but impurities in the ethylene. In the 300 cases there were less than 10 cases of severe vomiting, regardless of the condition of the patient, and the stomach lavage has been necessary but 4 or 5 times. Including all cases, vomiting either mild or severe has been present in less than 25 per cent of the cases.

Gas pains have been the source of very little complaint; certainly, very definitely less than for ether anesthesias and when present have usually been in cases of severe peritoneal irritation.

Food can be more freely given than after ether anesthesia. Liquids have been taken very freely in most cases on the day of operation and often broths or even milk drinks have been tolerated, depending, of course, upon the length of the anesthesia and the nature of the surgical procedure. On the first and second post-operative day soft diet has been well taken where the operative condition has not contraindicated.

The general convalescence has unquestionably been far more uneventful and definitely more rapid in the ethylene cases and the general condition of the patient, especially the first post-operative days, is surely better than with other general anesthetics. Undoubtedly, this is a factor in speeding up the convalescence and a patient's stay in the hospital.

Of the cases of special interest, we wish to men-

tion that of a patient operated for acute appendicitis, who had a history of angina pectoris. This patient was anesthetized with ethylene at 9:45 A. M. and in twenty minutes had an attack in which the pulse became slower and very weak, the extremities became cold, the body was cold, and covered with excessive perspiration, and the respiration rate decreased. The operation was stopped and the patient given oxygen immediately, coming out of the anesthesia very promptly, but apparently in considerable pain. In about five minutes the attack had subsided and the patient was re-anesthetized and the operation was finished uneventfully. It is a question, of course, how well the patient would have fared with an anesthesia less easily controlled than ethylene, and whether the operation could also have been finished without further disturbance.

In the case of a boy, aged 7, we had the coincidence of an acute appendicitis (ruptured) and a lobar pneumonia. The patient was very sick, but surgery was necessary, and the appendix was removed under ethylene anesthesia. The boy recovered in the usual time of a drainage case, with no further complications and the pulmonary condition apparently in no way affected by the anesthesia.

Two cases of thoracoplasty on tuberculous patients have been successfully performed under ethylene anesthesia in which the patients recovered promptly from the surgical procedure, evidently suffering very little shock and giving no evidence of irritation or disturbance to the pulmonary condition. In one case, the first stage was done before ethylene had been instituted at this hospital, so that local and nitrous oxide anesthesia was used. The anesthesia was quite unsatisfactory, the patient having considerable pain and suffering definite shock. With the second stage, in which portions of a larger number of ribs were removed and the procedure generally was more radical, we had an uneventful ethylene anesthesia, with practically no post-operative shock and a very rapid recovery.

The average cost of ethylene-oxygen anesthesia, as it is given routinely, has been about $2.40 to $3.00 per hour, with the ethylene alone averaging about $2.00 to $2.40 per hour. It is evident that ethylene costs definitely much less than nitrous oxide and about that same proportion more than ether. However, in considering the advantages of ethylene over the other general anesthetics, especially from the standpoint of the comfort and well-being of the patient, besides the saving in shorter hospitalization, the extra cost is well compensated for.

SUMMARY

1. All ages seem to tolerate ethylene anesthesia very well, and it is, apparently, an ideal anesthetic for both the age extremes.

2. Induction has been quiet and rapid, except in some cases of alcoholics and general peritonitis.

3. The relaxation has been usually sufficient for all surgical procedures. In cases where it is not sufficient with ethylene-oxygen alone, ether vapor, which is easily administered in conjunction with the ethylene-oxygen apparatus in small amounts, gives the desired relaxation, without affecting the post-operative results of ethylene anesthesia.

4. The recovery from the anesthesia is uniformly prompt. It is not infrequently accompanied by a momentary return of the vomiting reflex.

5. Seventy-five per cent of cases show a slight decrease or no change in the respiratory rate and the other 25 per cent have a rise of 3 to 4 respirations per minute. Fifty per cent of the cases show a slight decrease or no change in the pulse rate and the other 50 per cent show only an increase of seven to eight beats per minute.

6. There has been no noticeable change in blood pressure either during or after the anesthesia; nor has the blood clotting time been changed from normal during the anesthesia.

7. Medication for relief of pain after operation is necessary sooner after ethylene cases than for ether.

8. In our series of cases, which included both minor and major surgery, the vomiting following operations has been present in about 25 per cent of cases; very rarely is it severe or prolonged, and usually occurring but one or two times. Slight vomiting is quite frequently present in the operating room, just before the patient awakens. Impurities in the commercial ethylene undoubtedly are an important causative factor for some post-operative vomiting.

9. Pulmonary conditions apparently are not affected by the ethylene anesthesia; at least it can be given with relatively very little danger.

10. The cost of ethylene-oxygen anesthesia is considerably less than for nitrous oxide, and though more costly than ether, its many advantages definitely offset this increased cost.

MINNESOTA MEDICINE

OFFICIAL JOURNAL MINNESOTA STATE MEDICAL ASSOCIATION, SOUTHERN MINNESOTA MEDICAL ASSOCIATION, NORTHERN MINNESOTA MEDICAL ASSOCIATION, AND MINNEAPOLIS SURGICAL SOCIETY

Owned and Published by
The Minnesota State Medical Association
Under the Direction of Its
EDITING AND PUBLISHING COMMITTEE

R. E. FARR, M.D. Minneapolis
JOHN M. ARMSTRONG, M.D. St. Paul
L. B. WILSON, M.D. Rochester
F. L. ADAIR, M.D. Minneapolis
J. T. CHRISTISON, M.D., St. Paul

EDITORIAL OFFICE
CARL B. DRAKE, M.D., Editor
402 Guardian Life Bldg., Saint Paul

BUSINESS OFFICE
J. R. BRUCE, Business Manager
402 Guardian Life Bldg., Saint Paul
Telephone: Cedar 1683
201 Commercial Bldg., Minneapolis
Telephone: Atlantic 2716

All correspondence regarding editorial matters, articles, advertisements, subscription rates, etc., should be addressed to the Journal itself, not to individuals.

All advertisements are received subject to the approval of the Council on Pharmacy and Chemistry of the American Medical Association.

Contents of this publication protected by copyright.

Subscription Price: $3.00 per annum in advance. Single Copies 25c. Foreign Countries $3.50 per annum.

VOL. VII AUGUST, 1924 No. 8

EDITORIAL

Ethylene Anesthesia

The gas ethylene (C_2H_4) is one of the new general anesthetics. It was introduced by Luckhardt and Carter, and was first used in the Presbyterian Hospital, Chicago. It is one of the hydrocarbon gases which is prepared by removing one molecule of water from grain alcohol. It may be looked on as an anesthetic occupying an intermediate place between nitrous oxide and ether, and has certain very distinct advantages.

Ethylene may be given through the ordinary gas inhaler. About 20 per cent of oxygen must be combined with it. It mixes satisfactorily with ether, and through the ordinary inhaler, from 1 to 25 per cent of ether vapor may be given at any time. Anesthesia may be produced by ethylene within two or three minutes, and with very little discomfort to the patient; very seldom is any excitement or sense of suffocation experienced. When ethylene is properly given very little change in the pulse or respiration is noticed. Patients perspire but little and awaken quickly after the anesthetic is withdrawn. It is borne well by the lungs and there is little tendency toward accumulation of mucus in the respiratory tract or throat.

The relaxation produced is sufficient for all ordinary operations outside the abdomen, but in order to obtain the proper relaxation in intra-abdominal operations it is often necessary to use in conjunction with ethylene other substances which tend to increase relaxation. One-sixth of a grain of morphin administered half an hour before an operation tends to increase the efficiency of the anesthetic, and in abdominal work greater relaxation may be produced by the injection of 0.5 per cent novocain solution in the subperitoneal tissues after the incision has been made through the skin, aponeurosis and muscles. In all abdominal operations the narrow margin of anesthesia produced by ethylene may be broadened, and relaxation increased by administering also a small amount of ether (1 to 8 per cent). There is probably as much vomiting following ethylene anesthesia as following ether, but the reflexes are quickly regained after the anesthetic is discontinued, and patients are usually well able to take care of any material vomited.

In obstetrical work a combination of nitrous oxid and ethylene has proved very satisfactory. As an adjunct to local anesthesia during certain periods when it is necessary to make traction, and so forth, ethylene is also of great advantage on account of the rapidity with which anesthesia is produced and the ease with which patients awaken after it is discontinued.

Ethylene has the disadvantage of being a very inflammable gas, and cannot be safely given while a thermocautery of any sort is being used. This difficulty may be overcome by discontinuing the use of ethylene gas and supplanting ether for a few minutes before and during the time the cautery is to be used.

Ethylene given in lethal doses to animals kills by paralyzing respiration, but cardiac failure is late in developing, and after respiratory failure has occurred animals may be resuscitated by inducing artificial respiration.

Surgeons who work with ethylene as an anesthetic, especially in the abdominal cavity, should develop a technic similar to that used in operating under local anesthesia; that is, gentle manipulation with as little traction as possible on the abdominal walls or abdominal organs.

For many years ether has occupied a prominent

place among anesthetics; it is so safe and produces such excellent relaxation that it will be difficult to displace it completely with another anesthetic. Ethylene may be regarded, however, as one of the newer anesthetics, which will probably occupy an important place unless it is replaced by an agent which is less inflammable, or superior.

W. E. S.

The Arrangements for Meeting Places for Medical Societies

As previously stated in this Journal the meeting of the American Medical Association from June 9th to 14th was held on the new Municipal Pier in Chicago. It was the largest in point of attendance ever held. The various sections were all housed in subdivisions of the pier under one roof. The halls were made by building up the lateral walls from the floor to the roof and subdividing the long pier by means of some thin material similiar to compoboard. A small door was placed at the rear end of each hall for the purpose of entrance and exit of the fellows. A platform about three feet high was placed at the other end of each room and folding chairs were distributed throughout the hall.

While it was of great advantage to have all the sections meet under one roof and the space allotted for displays was ideal, there were some features about the arrangements for the meeting which were unsatisfactory and offer subject material for some observations.

The inadequacy of the halls themselves was perhaps more noticeable in the larger sections. The only provision for ventilation was through the small door in the rear of the hall. Incidentally, when this door was open or when the curtain overhanging it was pulled aside a flood of light entered the hall which interfered greatly with the demonstration of lantern slides. The acoustics were so bad that in some of the halls anyone situated toward the rear could hear only the loudest speakers. To add to the difficulty in hearing, street cars and trucks passing along outside the pier contributed sufficient noise to be most exasperating. In addition, the constant movement of the chairs about the floor incident to the coming and going or the restlessness of the fellows added to the turmoil. As a matter of fact, it was necessary for the individual, if he wished to hear the speakers, to sit so near the front in some of the large halls that the lack of ventilation was most depressing. The absence of shaded drop-lights and speakers' stands was also noticeable.

Poor acoustics, poor ventilation and lack of facilities to show lantern slides always have a tendency to make the members become restive and at this meeting it was our observation that occasions in which those farthest from the stage were not talking with each other, moving their chairs around and adding to the inconvenience of those who were trying to listen were the exception rather than the rule.

It is an indisputable fact that the hall presenting perfect acoustics, immovable chairs, carpeted aisles, a maximum of elimination of noise and facility for the demonstration of lantern slides or motion pictures without unnecessary delays gives the speaker the best opportunity to present his subject and gives his listeners likewise an opportunity to gain the maximum benefit therefrom.

In these matters the local committee of arrangements of any medical association has an important duty to perform. Attention to the above mentioned details before the opening of the session should receive more attention than it has in the past.

Too often, men have spent a great deal of time and money in the preparation of lantern slides or motion pictures only to find on their arrival at the meeting place that no provision has been made for the exhibition of the same. While it is true that arrangements were made for the exhibition of motion pictures in a separate hall, this method of teaching and demonstrating has reached the stage where a motion picture outfit should be available before any of the sections should some contributor to the program find it desirable.

This criticism, which is intended to be entirely constructive, applies as well to the meeting places of all medical associations as to that of the national organization. In our opinion there is, however, decidedly less reason for failure to provide each section with the simple prerequisites mentioned above when considering the meeting of the American Medical Association than there is in regard to most other organizations and it is in the hope of bringing about an improvement in these important details during future meetings that this criticism is made.

OBITUARY

DR. O. M. HAUGAN

Dr. O. M. Haugan, well known physician of Fergus Falls, died at St. Luke's Hospital, Fergus Falls, May 25, 1924, as a result of cerebral hemorrhage and complications.

Dr. Haugan was born near Trondhjem, Norway, fifty-seven years ago. At the age of five he came with his parents, a brother and three sisters, to South Dakota. Here near the village of Volin, where he was raised, he was brought for burial in the family lot, where his parents and two sisters had been laid to rest before him.

After attending the country public schools, Otto Haugan went to Red Wing Seminary, where he graduated from the Collegiate Department. He also taught there during the last year of his course. He later taught in the public schools of Ottertail County, Minnesota, and in Iowa. He then entered the University of Minnesota and finished the literary course in three years, following which he returned to Ottertail County, where he served for several years as superintendent of the county schools.

Dr. Haugan received his medical training at Northwestern University. Following his graduation there in 1902 he came directly to Fergus Falls, where he practiced to the time of his death, a period of twenty-one years.

Dr. Haugan was a man of lovable disposition and was very popular in his community. While he kept abreast with medical progress by taking some post graduate work almost every year, he never lost his interest in educational activities to which his earlier life was devoted. He was a member of the school board and was much in demand as a public speaker at graduation exercises and at various meetings of young people's societies. His entire life was a reflection of early training in a Christian home and his motto in life was "Service." He died as he had lived in the midst of service to his fellow men.

THEO. S. PAULSON, M.D.

DR. BENJAMIN HARVEY OGDEN

Dr. Benjamin Harvey Ogden, St. Paul, died on June 12, at the age of sixty-four years.

Dr. Ogden was born in Northfield, Minnesota, where he received his early schooling and was graduated from Carleton College in 1881. He received his degree as Doctor of Medicine from Hahnemann Medical College of Philadelphia in 1885.

After practicing his profession in Northfield for a year, Dr. Ogden moved to St. Paul, where he was actively engaged as physician and surgeon until failing health a year ago forced him to retire. Dr. Ogden was a member of the staffs of Ancker, Miller, St. Luke's and St. Joseph's hospitals in St. Paul. He had also held the presidency of the State Homeopathic Society and was for a time connected with the College of Medicine at the University of Minnesota and held membership in both the Ramsey County and Minnesota State Medical Associations.

Dr. Ogden is survived by his wife, a daughter, Mrs. Arletta Kuby, and a son, Dr. Warner Ogden of St. Paul.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MINNESOTA STATE MEDICAL ASSOCIATION

The annual meeting of the Minnesota State Medical Association is scheduled to meet in St. Cloud, Wednesday, Thursday and Friday, October 8, 9 and 10, 1924. Arrangements for the program are nearing completion in the hands of the Program Committee, which is made up of the chairmen of the two sections, Medicine and Surgery, Dr. E. L. Tuohy, Duluth, and Dr. A. C. Strachauer, Minneapolis, and the secretary of the State Association, Dr. Carl B. Drake, St. Paul.

Dr. C. B. Lewis, St. Cloud, who is acting as chairman of general arrangements, is completing plans for the meeting with the aid of the following local committees:

Committee on Exhibits—H. W. Goehrs, Chairman, I. E. Bowing, H. F. Clark.

Committee on General Entertainment—Wm. Friesleben, Chairman, P. E. Stangl, T. N. Fleming.

Committee on Hotel Accommodations—J. H. Beaty, Chairman, J. C. Boehm.

Committee on Entertainment of Ladies—J. P. McDowell, Chairman, C. A. Rathburn.

Committee on Lantern Slides—M. J. Kern, Chairman, C. F. Brigham.

Committee on Reception of Members—W. L. Beebe, Chairman, A. D. Whiting.

Committee on Telephone Service—F. H. Stangl, Chairman, Julius Adams.

Committee on Meeting Places—C. S. Sutton, Chairman, J. S. Dunn.

Sign Committee—H. McGibbin, Chairman, L. P. Adams.

Golf Committee—J. J. Gelz, Chairman.

NORTHERN MINNESOTA MEDICAL ASSOCIATION

The annual meeting of the Northern Minnesota Medical Association will be held in Duluth, Monday and Tuesday, August 4 and 5, 1924, in the auditorium of St. Mary's Hospital. The forenoons will be given to clinics, the scientific program being held each afternoon. Guests at the meeting will be entertained at a banquet Monday evening.

Clinics for the morning sessions have been arranged as follows:

Monday, August 4th, 8 A. M. to 12:30 P. M.—

Surgical Clinic:
- Dr. T. L. Chapman
- Dr. W. A. Coventry

Internal Medicine:
- Dr. S. H. Boyer
- Dr. F. W. Spicer
- Dr. L. L. Merriman

Pediatric Clinic:
- Dr. O. W. Rowe
- Dr. C. O. Kohlbry

Orthopedic and Associated Clinics:
- Dr. J. R. Kuth
- Dr. B. F. Davis

Tuesday, August 5th, 8 A. M. to 12:30 P. M.—

Internal Medicine Clinic:
Dr. E. L. Tuohy
Dr. T. R. Martin
Dr. F. J. Hirschboeck
Dr. P. G. Boman

Surgical Clinic:
Dr. A. N. Collins
Dr. A. J. Braden
Dr. A. L. McDonald

Surgical and Obstetrical Clinic:
Dr. J. R. Manley
Dr. W. R. Bagley

Skin and Genito-urinary Clinic:
Dr. E. Z. Shapiro
Dr. M. A. Nicholson

The following papers will be given at the afternoon sessions:

Address—Dr. Willard Bartlett, St. Louis, Mo.

"Forms of Organotherapy Which Have Proven to Be of Unquestionable Value." Dr. L. G. Rowntree, Rochester.

Address—Dr. C. N. Callander, Fargo, N. D.

"Acute Appendicitis." Dr. Theo. Bratrud, Warren. Discussion: Dr. R. E. Farr, Minneapolis.

"Care and Treatment of Nephritis in Children." Dr. F. W. Schlutz, Minneapolis.

"Indications for Surgery in Duodenal Ulcer." Dr. Verne S. Cabot, Minneapolis.

"The Common Cold." Dr. F. W. Briggs, Duluth.

"Intestinal Parasites." Dr. M. A. Shillington, St. Paul.

"Fractures of the Hip." Dr. M. S. Henderson, Rochester.

"Some Little Appreciated But Valuable Therapeutic Measures." Dr. G. S. Wattam, Warren.

"Reminiscences of Thirty Years Ago." Dr. P. G. Cowing, Evansville.

"Fatigue in the School Child." Dr. Max Seham, Minneapolis.

"Diagnosis and Treatment of Upper Urinary Tract Obstruction." Dr. F. E. B. Foley, St. Paul.

Address—Dr. G. B. New, Rochester.

Address—Dr. H. Gideon Wells, Chicago, Ill.

"Some Phases of Epilepsy." Dr. E. M. Hammes, St. Paul.

"The History and Present Status of the Non-surgical Treatment of Hemorrhoids." Dr. W. A. Fansler, Minneapolis.

THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

This Association, which meets annually, will convene in Toronto in August. The purpose of the association is to further "systematic direction to scientific inquiry" and "to promote the intercourse of those who cultivate science in different parts of the British Empire." Meetings are held annually in England and from time to time in various parts of the Empire. It last convened in Canada in 1909. The average enrollment for the 83 years previous to 1920 was 2,330.

The organization comprises thirteen sections. Those on Chemistry, Physiology and Psychology should be of particular interest to the medical profession. Among the subjects that will be discussed are:

Advances made in our knowledge of disease.

Studies in visceral reflexes.

On the tactile sensory reflex.

Fractionate contractions in premature ventricular systoles in mammalian hearts.

Physiological and psychological factors of muscular efficiency in industry.

Vitamines and the relation of light to their action.

The respiratory quotient.

Insulin.

The list of those who will appear on the program includes the following names: H. H. Dale, A. B. Macallum, W. B. Cannon, Robert Kennedy, G. H. Parker, P. A. Shaffer, L. B. Mendel, T. B. Osborne, and D. D. Van Slyke.

The Physiology section will commence on Thursday, August 7. Physicians may obtain annual membership entitling them to convention privileges for the modest sum of $5.00 sent to the local Hon. Treasurer, British Association, Room 50, Physics Bldg., University, Toronto. Additional information may be obtained from the local secretary at the same address.

REDWOOD-BROWN COUNTY MEDICAL SOCIETY

The annual meeting of the Redwood-Brown Medical Society was held at Sanborn, June 20, 1924. Officers elected for the following year were: President, Dr. J. Adams, Morgan; vice president, Dr. Theo. F. Hammermeister, New Ulm; secretary-treasurer, Dr. William A. Meierding, Springfield. Dr. F. D. Gray of Marshall was elected to act as delegate to the annual meeting of the State Medical Association in St. Cloud, with Dr. George B. Weiser, New Ulm, as alternate.

LYMANHURST AND PARKVIEW STAFF MEETING

The regular monthly meeting of the Lymanhurst and Parkview medical staffs will be held at the Lymanhurst School, 1800 Chicago Avenue, Minneapolis, Tuesday evening, August 26, at 7:00 o'clock.

The following program will be given:

"Review of Chemistry of Tuberculosis," Dr. W. P. Larson.

"Review of Calmet's Recent Work in Tuberculosis," Dr. W. P. Larson.

"Recent Developments in Bacteriology and Serology in Tuberculosis," Dr. Montank.

"The Pathology of Tuberculosis," Dr. Kano Ikeda.

All persons interested in tuberculosis are invited to attend these meetings and participate in the discussions.

INTER-STATE POST-GRADUATE ASSEMBLY

The Inter-State Post-Graduate Assembly, directed by the Tri-State District Medical Association, extends a hearty invitation to the physicians of America who are in good standing in their State or Provincial Societies to attend the annual assembly, which is to be held at Milwaukee, Wisconsin, October 27th, 28th, 29th, 30th and 31st, five full days of post-graduate work.

Among the eminent members of the profession and citi-

zens who have accepted places on the program are the following:

Dr. Nicholas Murray Butler, President of Columbia University, New York, N. Y.

Sir Arthur William Currie, President of McGill University, Faculty of Medicine, Montreal, Canada.

Merritte W. Ireland, Surgeon-General of United States Army, Washington, D. C.

Monsieur J. Jusserand, French Ambassador to United States, Washington, D. C.

Edward E. Stitt, Surgeon-General of United States Navy, Washington, D. C.

Professor Theodore Tuffier, Prof. of Surgery, Faculty of Medicine, Paris, France.

Dr. John V. Barrow, Los Angeles, California.

Dr. W. F. Braasch, Mayo Clinic, Rochester, Minnesota.

Dr. George E. Brewer, Emeritus Prof. of Surgery, Columbia University, College of Physicians and Surgeons, New York, N. Y.

Dr. Alan Brown, Prof. of Pediatrics, University of Toronto, Faculty of Medicine, Toronto, Canada.

Dr. Ralph C. Brown, Assistant Prof. of Medicine, Rush Medical College, Chicago, Illinois.

Dr. C. Macfie Campbell, Prof. of Psychiatry, Harvard University, School of Medicine, Cambridge, Massachusetts.

Dr. Walter T. Connell, Prof. of Medicine, Queen's University, Faculty of Medicine, Kingston, Canada.

Dr. John F. Cowan, Prof. of Surgery, Stanford University, School of Medicine, San Francisco, California.

Dr. George W. Crile, Prof. of Surgery, Western Reserve University, School of Medicine, Cleveland, Ohio.

Dr. Samuel J. Crowe, Clinical Prof. of Laryngology, Johns Hopkins University, School of Medicine, Baltimore, Maryland.

Dr. LeRoy Crummer, Prof. of Medicine, University of Nebraska, College of Medicine, Omaha, Nebraska.

Dr. Walter E. Dandy, Associate Prof. of Surgery, Johns Hopkins University, School of Medicine, Baltimore, Maryland.

Dr. William Darrach, Dean and Associate Prof. of Surgery, Columbia University, College of Physicians and Surgeons, New York, N. Y.

Dr. Vernon C. David, Assistant Prof. of Surgery, Rush Medical College, Chicago, Illinois.

Dr. David J. Davis, Prof. of Pathology and Bacteriology, University of Illinois, School of Medicine, Chicago, Illinois.

Dr. John B. Deaver, Prof. of Surgery, University of Pennsylvania, School of Medicine, Philadelphia, Pa.

Dr. Laurence R. DeBuys, Prof. of Pediatrics, Tulane University, School of Medicine, New Orleans, Louisiana.

Dr. George F. Dick, Assistant Prof. of Medicine, Rush Medical College, Chicago, Illinois.

Dr. Charles A. Elliott, Prof. of Medicine, Northwestern University, School of Medicine, Chicago, Illinois.

Dr. Leonard W. Ely, Prof. of Surgery, Stanford University, School of Medicine, San Francisco, California.

Dr. Joseph Evans, Prof. of Medicine, University of Wisconsin, School of Medicine, Madison, Wisconsin.

Dr. A. MacKenzie Forbes, Clinical Prof. of Orthopedics, McGill University, Faculty of Medicine, Montreal, Canada.

Dr. William Goldie, Associate Prof. of Medicine, University of Toronto, Faculty of Medicine, Toronto, Canada.

Dr. Marvin L. Graves, Prof. of Medicine, University of Texas, School of Medicine, Galveston, Texas.

Sir Henry Gray, Royal Victoria Hospital, Montreal, Canada.

Dr. Don M. Griswold, Prof. and Head of Department of Preventive Medicine and Hygiene, State University of Iowa, Iowa City, Iowa.

Dr. Garfield M. Hackler, Prof. of Surgery, Baylor University, School of Medicine, Dallas, Texas.

Dr. John A. Hartwell, Associate Prof. of Surgery and Clinical Surgery, Cornell University, Medical College, New York, N. Y.

Dr. Carl A. Hedblom, Prof. of Surgery, University of Wisconsin, School of Medicine, Madison, Wisconsin.

Dr. William B. Hendry, Prof. of Obstetrics and Gynecology, University of Toronto, Faculty of Medicine, Toronto, Canada.

Dr. Russell D. Herrold, McCormick Institute for Infectious Diseases, Chicago, Illinois.

Dr. Julius H. Hess, Prof. of Pediatrics, University of Illinois, School of Medicine, Chicago, Illinois.

Dr. Russell A. Hibbs, Prof. of Orthopedic Surgery, Columbia University, College of Physicians and Surgeons, New York, N. Y.

Dr. Frederick J. Kalteyer, Associate Prof. of Medicine, Jefferson Medical College, Philadelphia, Pennsylvania.

Dr. Allen B. Kanavel, Prof. of Surgery, Northwestern University, School of Medicine, Chicago, Illinois.

Dr. Ralph A. Kinsella, Associate Prof. of Medicine, University of St. Louis, School of Medicine, St. Louis, Missouri.

Dr. Francis H. Lahey, Prof. of Clinical Surgery, Harvard University, School of Medicine, Boston, Massachusetts.

Dr. Dean Lewis, Prof. of Surgery, Rush Medical College, Chicago, Illinois.

Dr. LeRoy Long, Dean and Prof. of Surgery, University of Oklahoma, School of Medicine, Oklahoma City, Oklahoma.

Dr. William E. Lower, Prof. of Urology, Western Reserve University, School of Medicine, Cleveland, Ohio.

Dr. Charles B. Lyman, Prof. of Clinical Surgery, University of Colorado, School of Medicine, Denver, Colorado.

Dr. N. J. MacLean, Associate Prof. of Surgery, University of Manitoba, Faculty of Medicine, Winnipeg, Canada.

Dr. Ralph H. Major, Prof. and Head of Department of Medicine, University of Kansas, School of Medicine, Rosedale, Kansas.

Dr. Charles H. Mayo, Mayo Clinic, Rochester, Minnesota.

Dr. William J. Mayo, Mayo Clinic, Rochester, Minnesota.

Dr. Edward Miloslavich, Director of Department of Pathology and Bacteriology, Marquette University, School of Medicine, Milwaukee, Wisconsin.

Dr. Roger S. Morris, Prof. of Medicine, University of Cincinnati, School of Medicine, Cincinnati, Ohio.

Dr. Bernard H. Nichols, Department of Roentgenology, Cleveland Clinic, Cleveland, Ohio.

Dr. Walter L. Niles, Dean and Prof. of Clinical Medicine, Cornell University, School of Medicine, New York, N. Y.

Dr. Dallas B. Phemister, Assistant Prof. of Surgery, Rush Medical College, Chicago, Illinois.

Dr. William F. Petersen, Associate Prof. of Pathology and Bacteriology, University of Illinois, School of Medicine, Chicago, Illinois.

Dr. Harry M. Richter, Prof. of Surgery, Northwestern University, School of Medicine, Chicago, Illinois.

Dr. Stanley P. Reimann, Director of Laboratories, Lankenau Hospital, Philadelphia, Pennsylvania.

Dr. David Riesman, Prof. of Clinical Medicine, University of Pennsylvania, School of Medicine, Philadelphia, Pennsylvania.

Dr. Milton J. Rosenau, Prof. of Preventive Medicine and Hygiene, Harvard University, School of Medicine, Boston, Massachusetts.

Dr. E. C. Rosenow, Mayo Clinic, Rochester, Minnesota.

Dr. G. W. Stevens, Milwaukee, Wisconsin.

Dr. Wallace Irving Terry, Prof. of Surgery, University of California, School of Medicine, San Francisco, California.

Dr. John H. J. Upham, Prof. and Head of Department of Medicine, University of Ohio, School of Medicine, Columbus, Ohio.

Dr. George Gray Ward, Jr., Prof. of Obstetrics and Gynecology, Cornell University, School of Medicine, New York, N. Y.

Dr. Louis M. Warfield, Prof. of Internal Medicine, University of Michigan, School of Medicine, Ann Arbor, Michigan.

Dr. George Weaver, McCormick Institute for Infectious Diseases, Chicago, Illinois.

Dr. Charles J. White, Prof. of Dermatology, Harvard University, School of Medicine, Boston, Massachusetts.

Dr. Charles S. Williamson, Prof. of Medicine, University of Illinois, School of Medicine, Chicago, Illinois.

Dr. Milton C. Winternitz, Dean of Yale University, School of Medicine; Prof. of Pathology and Bacteriology, New Haven, Connecticut.

Dr. John A. Witherspoon, Prof. of Medicine, Vanderbilt University, Medical Department, Nashville, Tennessee.

Dr. John L. Yates, Milwaukee, Wisconsin.

Dr. Hugh H. Young, Clinical Prof. of Urology, Johns Hopkins University, Medical Department, Baltimore, Maryland.

Dr. Abraham Zingher, Assistant Prof. of Hygiene, University and Bellevue Hospital, Medical College, New York, N. Y.

This Association is supervising an Inter-State Post-Graduate Clinic Tour to Canada, British Isles and France, to start May 18, 1925. Leading teachers and clinicians of Canada and Europe will arrange and conduct clinics and demonstrations in the following clinic cities: Toronto and Montreal, Canada; London, Liverpool, Leeds, Manchester and Newcastle, England; Edinburgh and Glasgow, Scotland; Dublin and Belfast, Ireland; Paris, Lyons and Strasburg, France.

Besides the main tour, special tours to practically all the leading centers of Europe will be arranged. Sightseeing trips to all places of interest in the countries visited will be included in the regular tour.

The cost of the tour, including first-class hotels, board, steamship, clinic arrangements and all ordinary traveling expenses, will be under $1,000.00. The tour is open to physicians in good standing in their State Societies, their families and friends who are not physicians.

Those desiring further information should communicate with the Managing Director, William B. Peck, Freeport, Illinois.

WABASHA COUNTY MEDICAL SOCIETY

The fifty-sixth annual meeting of the Wabasha County Medical Society was held at Lake City, Minnesota, Thursday, July 10, 1924.

Following the business session a dinner was served at the Hotel Lyon at 1 P. M.

Papers presented at the afternoon session included:

President's Address, "Some Matters Pertaining to the Welfare of the Medical Profession." Dr. W. H. Replogle, Wabasha.

"Studies in Hepatic Function." Dr. C. H. Green, Surgical Section, Mayo Clinic, Rochester.

"Some Aspects of the Nephritis Problem." Dr. N. M. Keith, Medical Section, Mayo Clinic, Rochester.

Officers elected for the coming year are: President, Dr. H. E. Bowers, Lake City; vice president, Dr. R. S. Gutsell, Zumbro Falls; secretary-treasurer, Dr. W. F. Wilson, Lake City.

Resolutions were adopted favoring periodic health examinations, reasonable publicity regarding accomplishments and aims of scientific medicine, measures to control quacks and irregulars.

It was voted to hold the next meeting at Plainview, Minn.

OF GENERAL INTEREST

Dr. P. J. Griffin, lately of Detroit, Minn., recently moved to his former location at Fertile.

Dr. J. C. Rothenburg, Springfield, recently returned from a motor trip through Montana.

Drs. A. F. and Mary Strickler of Sleepy Eye have just returned from a tour of the western states.

Dr. R. B. Hullsiek, St. Paul, is associated with Dr. C. N. Hensel, 1014 Lowry Bldg., in the practice of internal medicine.

Eternal vigilance in the matter of vaccination seems to be necessary for the prevention of smallpox. From the first of the year until May 31st, 1,341 cases and 109 deaths have been reported in Detroit, Michigan.

Dr. H. L. Sargeant, who has just finished a two-year postgraduate course at the Mayo Clinic, Rochester, recently moved his family to Fergus Falls, where he is associated with Dr. O. T. Sherping and Dr. C. O. Estrem in the practice of his profession.

Dr. and Mrs. F. P. Strathern of St. Peter spent the latter part of June and the first of July in Chicago and Battle Creek, Michigan, where Dr. Strathern took advantage of the opportunity to make a study of interpretation of x-rays of the chest and abdomen.

Dr. R. C. Webb, Minneapolis, read a paper on "Fractures of the Tibia and Fibula" before the Great Northern Railroad Surgeons Association at Spokane, Washington, June 24, 1924. Dr. Webb also attended the Northwestern

Medical Association meeting in Vancouver, B. C., June 26 to 28.

In a recent address, Dr. Banting related how the observation by Dr. Moses Barron of Minneapolis of the effect of experimental ligation of the pancreatic duct led to the deduction that by this means it might be possible to eliminate the products of the acinous cells and obtain the product of the islets. Thus is research founded upon research.

Resignation of Miss Louise M. Powell as director of the School of Nursing, University of Minnesota, and of Dr. LeRoy A. Calkins, as assistant professor of Gynecology and Obstetrics, were recommended to the president of the Administrative Board of the Medical School at a meeting held June 23, 1924. The secretary was instructed to convey to both the expression of the regret and appreciation of the Administration Board.

The following nominations were approved and recommended at the May meeting of the Administrative Board of the Medical School, University of Minnesota: Dr. Frank W. Stevenson, as Assistant in Medicine; Dr. G. R. Kamman, as Assistant in Nervous and Mental Diseases; Dr. H. W. Grant, as Assistant in Ophthalmology and Oto-Laryngology; Dr. A. N. Noran, as Assistant in Pediatrics. The resignation of Dr. A. L. Kusske as refractionist was accepted and nomination was made of Dr. Harold J. Goss to fill the vacancy.

Under the sponsorship of the Illinois State Medical Society there is in preparation "A History of Medical Practice in the State of Illinois" that must go to the printer at an early date. In order that this volume may be accurate and complete, all possible assistance is asked from every source, as to personal data and experiences, including diaries, photographs and similar documentary momentoes of pioneer Illinois doctors and of progressive phases of medical practice, as well as of achievements in fields other than those of medical science. Prompt return in good condition is promised for anything loaned the committee, the personnel of which is:

O. B. Will, M.D., Peoria, Ill.
C. B. Johnson, M.D., Champaign, Ill.
Carl E. Black, M.D., Jacksonville, Ill.
George A. Dicus, M.D., Streator, Ill.
James H. Hutton, M.D., Chicago, Ill.
Chas. J. Whalen, M.D., Chicago, Ill., Chairman

The scope of the volume will range from the discovery of Illinois to modern times. Through this period of over 250 years there is much of thrilling interest to be detailed. Collection of the human interest data can come only from the families or closest friends of the pioneers, many of whom long ago removed to distant sections of the United States.

Some of the subjects touched will be: Physicians accompanying early explorers; government surgeons and physicians in attendance at the forts; early medicine in Illinois; theories of healing from the days of the Aborigines through the mound-builders; French and English explorers; the ante-boundary days; sporadic settlers; medical attendants for the covered wagon; herb doctors; primitive surgery; medicine and missionaries; migration of pioneer physicians to new territory; the "circuit-riding" and "saddle-bag" doctors and their burdens, triumphs and perils; pioneers as "utility citizens"; Illinois men in war time—there are four conflicts to be considered since the opening of the Nineteenth Century; Illinois medical men away from medicine, i.e., in industry, in science, in belles-lettres—art, music and literature. Will any and all doctors, former residents of Illinois, or descendants of pioneer physicians of the "Illinois country," communicate at once with the Committee on Medical History, Illinois State Medical Society, 6244 North Campbell Avenue, Chicago, Illinois?

NEW AND NON-OFFICIAL REMEDIES

The following articles have been accepted by the Council on Pharmacy and Chemistry:

ABBOTT LABORATORIES:
Benzyl Fumarate

DESHELL LABORATORIES:
Petrolagar
Petrolagar (Unsweetened)
Petrolagar (with Phenolphthalein)
Petrolagar (Alkaline)

HOFFMANN-LA ROCHE CHEMICAL WORKS:
Digalen-Roche (Cloetta)
Ampules Digalen-Roche (Cloetta), 1.1 c.c.
Tablets Digalen-Roche (Cloetta)
Hypodermic Tablets Digalen-Roche (Cloetta)
Oleo-Bi-Roche
Ampules Oleo-Bi-Roche, 2 c.c.

MEAD JOHNSON AND COMPANY:
Mead's Cod Liver Oil

H. A. METZ LABORATORIES:
Sulpharsphenamine-Metz in 0.05, 0.075, 0.1, 0.15, 0.3, 0.45, 0.6 gm. ampules.

FREDERICK STEARNS AND COMPANY:
Insulin-Stearns
Insulin-Stearns Single Strength
Insulin-Stearns Double Strength

NEW AND NON-OFFICIAL REMEDIES

Neutral acriflavine-Abbott, 0.1 Gm. Ampules.—Each ampule contains 0.1 gm. neutral acriflavine-Abbott (see New and Non-official Remedies, 1924, p. 24). The Abbott Laboratories, Chicago.

Insulin-Stearns.—A brand of insulin. For a discussion of the actions, uses and dosage, see New and Non-official Remedies, 1924, p. 149. Insulin-Stearns is marketed: insulin-Stearns, single strength (5 c.c. vials containing 10 units in each c.c.), and insulin-Stearns, double strength (5 c.c. vials containing 20 units in each c.c.). Frederick Stearns and Co., Detroit.

Digalen-Roche (Cloetta).—A sterile solution containing in each c.c. 0.3 mg. of an active derivative of digitalis as isolated by Cloetta, containing 7.5 per cent of alcohol. The actions and uses of digalen-Roche (Cloetta) are the same as those of digitalis. The average dose is from 1 to 2 c.c. (15 to 30 minims). The maximum daily dosage is 6 c.c. (90 minims). Digalen-Roche (Cloetta) is also suitable for intramuscular and intravenous injection. Intravenous injections of 1 c.c. (15 minims) may be repeated at intervals

of one-half to one hour as necessary. Digalen-Roche (Cloetta) is also marketed as follows: ampules digalen-Roche (Cloetta), 1.1 c.c.; tablets digalen-Roche (Cloetta) (equivalent to digalen-Roche (Cloetta) 0.5 c.c.); hypodermic tablets digalen-Roche (Cloetta) (equivalent to digalen-Roche (Cloetta), 1 c.c.). The Hoffman-La Roche Chemical Works, New York. (Jour. A. M. A., June 14, 1924, p. 1937.)

Petrolagar.—A mixture composed of liquid petrolatum 65 c.c., agar 10 gm., sugar and flavoring 2 gm., sodium benzoate 0.1 gm., water to make 100 c.c. Petrolagar has the actions of liquid petrolatum. It is claimed that the emulsification of the liquid petrolatum increases its efficiency, and that the agar adds soft bulk and tends to increase peristalsis. The average dose of petrolagar is 15 c.c. morning and night. Petrolagar is also marketed in the form of petrolagar (unsweetened), containing no sugar, petrolagar (with phenolphthalein), containing 0.33 gm. phenolphthalein per 100 c.c., petrolagar (alkaline), containing milk of magnesia 25 c.c. per 100 c.c. The Deshell Laboratories, Inc., Los Angeles. (Jour. A. M. A., June 28, 1924, p. 2119.)

PROPAGANDA FOR REFORM

Chologogues.—As early as 1868, a British committee appointed to investigate the subject arrived at the conclusion that mild mercurous chlorid (calomel), mercuric chlorid and taraxacum—all reputed chologogues—do not increase the flow of bile but probably act on the bile-expelling apparatus. Recently the latest experimental procedure was applied to judge the status of a number of substances that have at various times been alleged to influence bile flow. With the exception of bile salts, negative results only were obtained with such substances as calomel and salicylates. All dependable evidence warrants the recommendation that clinicians consider the advisability of abandoning therapeutic efforts to "stimulate" the liver through the use of substances having alleged chologogic effects. (Jour. A. M. A., June 7, 1924, p. 1867.)

Gly-So-Iodonate.—A few months ago the Council on Pharmacy and Chemistry published a report on an alleged bactericide "Gly-So-Iodonate." The product is put on the market by a company whose name is much more imposing than its importance warrants—"The National Medical Research Laboratories" of Milwaukee, earlier known as the "Wisconsin Medical Laboratories." Charles E. Hutchings, who claims to be a "medical man," seems to have been the prime mover in putting "Gly-So-Iodonate" on the market. Hutchings, in letters, has stated that he is a "graduate of Kings College of London" and has claimed that he is a "member of Marquette Medical College." However, an inquiry directed to Kings College of London brought the reply that they had no record of a man of this name on the medical register. The Marquette University School of Medicine seems to be equally ignorant of Hutchings' connection with that institution. After the Council's report had been published, the National Medical Research Laboratories sent broadcast a six-page circular, three pages of which were devoted to what purported to be a "Partial List of Representative Industries Protecting Their Many Thousands of Employees from Infection With G-S-I." As it seemed reasonable to suppose that a concern which published a misleading formula for its product would be quite as likely to publish misleading references for the value of its product, some of the "representative industries" listed by the exploiters of "G-S-I" were written to. From the replies which were received, it seems evident that the basis for at least some of the references published by the exploiters of Gly-So-Iodonate rests on as flimsy a foundation as the alleged formula of the stuff and the educational claims of Charles E. Hutchings. (Jour. A. M. A., June 7, 1924, p. 1881.)

Morphin Addiction.—The so-called withdrawal symptoms which arise in those who have become accustomed to large doses of morphin are well known to all practitioners who are compelled to deal with such habitués. To account for these symptoms it has been alleged that the continuous taking of morphin causes the presence in the blood serum of a substance having a protective effect against this drug. However, it has been shown that the blood of a tolerant animal does not contain any protective substance against morphin, nor was there any substance capable of conferring any immunity to the toxic action of morphin on an animal into which it is injected detected in the blood serum of a human being who has acquired a high tolerance to morphin. Also, it has been proven that a specific toxic substance is not produced by habituation to morphin. Since some methods of treating drug addiction have been based on the belief that a toxic substance is formed, the time has arrived for seeking a new point of departure in the explanation of the various manifestations that are presented by drug addicts. (Jour. A. M. A., June 14, 1924, p. 1976.)

Whittington's Consumption Cure a Fraud.—The postal authorities have closed the mails to Frederick Graham and the Tuberculosis Home Remedy Company by the issuance of a fraud order. The Whittington "Cure" was the subject of a report in The Journal of the American Medical Association in 1916; analysis in the A. M. A. Chemical Laboratory at that time showed it to be a flavored syrup devoid of any potent ingredients except alcohol. The evidence brought out in the hearing by the Post Office authorities showed that the preparation was claimed to contain sugar, glycerin, alcohol and the extract matter from pyrus malus follia (apple leaves), gentian root, rhamnus purshiana (cascara) and licorice root. Analyses in the Bureau of Chemistry of the Department of Agriculture indicated the absence of gentian and the presence of only traces of cascara and licorice. No evidence was submitted to show how apple leaves had come to be hit upon as a "cure" for tuberculosis. (Jour. A. M. A., June 14, 1924, p. 1933.)

Atussin, Peptoproteasi, Paraganglina Vassale, Fosfoplasmina, Asmoganglina and Endo-Ovarina Tablets Not Accepted for N. N. R.—These products are manufactured in Italy and sold in the United States by the Neother Products Co., New York. Atussin is claimed to be a suprarenal preparation; Peptoproteasi, a gastric ferment preparation; Paraganglina Vassale, a suprarenal product; Fosfoplasmina, an egg yolk extract; Asmoganglina, an extract of the suprarenal and hypophysis, and Endo-Ovarina Tablets, an ovary preparation. In each case the statements made in regard to composition were indefinite and the therapeutic claims unwarranted. The booklet which the Neother Products Co. uses as advertising for these products consists of 151 pages, presents a jumble of fact and fancy, and reads more like a

patent medicine almanac than a scientific treatise. The Council on Pharmacy and Chemistry found Atussin, Peptoproteasi, Paraganglina Vassale, Fosfoplasmina, Asmoganglina and Endo-Ovarina Tablets unacceptable because: (1) their composition is indefinite or semisecret; (2) the therapeutic claims are unwarranted, and (3) their recognition would be the means of advertising proprietary products which are not accepted. (Jour. A. M. A., June 21, 1924, p. 2068.)

PROGRESS

Abstracts to be submitted to Section Supervisors.

PEDIATRICS

SUPERVISORS:

CHESTER A. STEWART,
LA SALLE BLDG., MINNEAPOLIS

ROY N. ANDREWS,
MANKATO CLINIC, MANKATO

ACUTE PELVIC ABSCESS IN CHILDREN: Philip Rosenblum and Ralph E. Bettman (Amer. Journal of Diseases of Children, April, 1924). The author reports three cases of acute pelvic abscess formation, with relief of symptoms in each case after drainage. In the first two, this occurred spontaneously through the vagina and in the third case artificially by operation. In the third case the cause of the abscess was proved to be not the appendix, and it probably did not originate from the internal genitalia, which were palpated and found to be normal. The abscess possibly originated from the retroperitoneal structures and was presumably of glandular origin. The frequent association of abdominal pain with throat conditions in childhood, recently brought to our attention by Brennemann, is new to us. Some pelvic abscesses might be from just such infections involving the lymph glands which break down. He is absolutely at a loss to explain the source otherwise. They were not appendiceal abscesses. These, of course, may rupture spontaneously, but they almost invariably rupture into the bowel. A spondylitis might give rise to a pelvic abscess but no signs or symptoms pointing to spinal origin were present, nor in such cases would the patients be apt to recover spontaneously. The fact that all three cases occurred in female patients, and that in two there was a discharge of pus from the vagina, might point to the genitalia as the source. Pyosalpinx has been known to occur in infants, and must be considered as a possible etiologic factor.

R. N. ANDREWS.

UBER INTRAPERITONEALE BLUT TRANSFUSIONEN: L. F. Meyer (Jahrb. f. Kinderheilkunde, Mar. 5, 1924, s. 188-200). Meyer has used the intraperitoneal method of giving citrated blood in 25 cases. He uses this method in any case in which a transfusion is indicated. His technique differs in one important point from the original procedure introduced by us. He has not found it necessary to group his donor and recipient and has not observed any ill effects. If this is substantiated by further clinical reports, it materially enhances the value of intraperitoneal transfusions. Meyer concludes that the results obtained from intraperitoneal transfusion are equivalent to those following direct intravenous transfusion.

DAVID SIPERSTEIN.

KLINISCHE UND EXPERIMENTELLE BEWEISE FUR DIE LEBENSFAHIGKEIT TRANSFUNDIERTER KORPERFREMDER ERYTHROCYTEN: Hans Opitz (Monatschr. f. Kinderheilk., Bd. 27, Jan., 1924, Heft. 4, pp. 376-384). Opitz concludes, from an extensive series of clinical cases, that large transfusions of blood are especially suitable for the anemias of infancy. He considers the transfusion a means of introducing active and functionable blood cells into the patient's circulation. The intravenous injection of plasma alone produced no rise in blood values, while the introduction of washed red blood cells caused a proportionate rise in the erythrocyte count. He finds that the injected blood does not act as a stimulative agent and as "building material" for new red cells, but that the injected cells actually function. His clinical data are, however, too accurate to be convincing to the reviewer.

DAVID SIPERSTEIN.

UBER ANEMIA PERNICIOSA UND PERNICIOSA-AHNLICHE ANEMIEN IM KINDESALTER: Hotz, A. (Jahr. f. Rinderh., Mar. 5, 1924, pp. 161-181). Hotz reports a case of pernicious anemia in a girl of 10, diagnosed by Nägeli. The patient presented typical clinical and hematological findings.

He also reports 2 very interesting cases of anemia of the pernicious type, who clinically presented a typical picture of a severe chronic digestive insufficiency (Herber's Infantilism). The clinical findings differentiate these cases from a true pernicious anemia. Furthermore, in one of his cases, the blood findings were characteristic of a secondary anemia, except at the height of the anemic stage.

DAVID SIPERSTEIN.

TUBERCULOSIS IN INFANCY—ITS PROGNOSIS AND PREVENTION: G. Albert Davis (Arch. of Ped., March, 1924). Tuberculosis in infants has always been considered a more or less hopeless condition. In a series of 114 cases under two years studied by Brown, the mortality was 70 per cent. Fishberg states that at least one out of three tuberculosis infected infants lives. It must be thoroughly understood, however, that we are speaking of cases which show tuberculous infection as evidenced by positive skin tests, and we are not limiting ourselves to cases showing symptoms of tuberculosis. Thus it is seen that tuberculous infection in infants under two years is not the virulent disease that it was previously considered. Under one year of age it is still a very severe infection with the chances against recovery, but not so in the age period between one and two years. In 77 per cent of our cases there was a definite history of exposure to a case of tuberculosis. This is the vulnerable point. Where the diagnosis is doubtful, as so frequently occurs, it is a wise precaution to give the infant the benefit of the doubt, and remove it from the questionable environment.

R. N. ANDREWS.

ROENTGENOLOGY

SUPERVISORS:

LEO G. RIGLER,
MPLS. GEN'L HOSPITAL, MINNEAPOLIS

A. U. DESJARDINS,
MAYO CLINIC, ROCHESTER

FUNDAMENTAL FACTS RELATIVE TO THE STUDY OF THE VERTEBRÆ IN INDUSTRIAL ACCIDENT CASES: George and Leonard (Radiology, April, 1924). This article presents a discussion of the roentgen findings in the vertebræ in relation to industrial work. An attempt has been made to describe clearly the average normal vertebra with a plate of a reconstructed skeleton as a key.

A number of normal variations in the vertebra are common. Among the most important are: (1) Bifid laminæ of the 5th lumbar; (2) sacralization of the 5th lumbar; (3) rudimentary rib on the 12th thoracic or enlarged transverse process on the first lumbar. All of these variations, in their opinion, have no clinical significance whatever.

Certain changes occur in the vertebra which they classify as: (1) Chronological, (2) Occupational, (3) Postural. These include scoliosis, hypertrophic, and sclerotic changes, which they believe probably are not due to injury at all, and certainly not to one single injury. They believe these changes occur normally with age and as the result of a particular occupation.

Under the effects of injury to the vertebræ they classify:

(1) Compression fracture of the body with few clinical and no neurological symptoms, followed by complete recovery.
(2) Compression of the body with comminution with more symptoms and a less favorable prognosis.
(3) Compression or comminution or both with a dislocation accompanied by very serious manifestations.
(4) Simple dislocation without any visible fracture.
(5) Kummell's disease, which is a rarefaction of the body of the vertebra gradually producing a wedge shape, believed by Kummell to follow injury after a long period of time. George and Leonard believe this occurs in older people and probably has no direct relationship to any recent injury.

They note that no matter how severe a fracture is, complete obliteration of the intervertebral space never occurs. They do not believe that complete fusion of two bodies can ever occur following injury. The body of the 5th lumbar vertebra is rarely compressed but the transverse processes are frequently broken.

Considerable detail is given to the discussion of fractures of the atlas and axis. The authors describe their method of determining malposition by drawing parallel lines connecting points on the atlas and axis. Distortion of these lines indicates some injury.

The authors doubt very seriously that spondylolisthesis is always due to injury because they have seen it frequently without injury, and also have observed it in patients who had no symptoms. They feel that more proof is needed before the roentgenologist can state in a report that spondylolisthesis has been due to injury.

The clinical use of the term "sacro-iliac dislocation" is sharply criticized. It requires extreme direct violence to produce this actually, and they have seen it only rarely in cases wherein it followed simply stooping or lifting. They note that the clinical diagnosis is made practically always without real *x*-ray substantiation. Sacro-iliac separation, that is a lateral separation, occurs. It is best seen in females with repeated pregnancies. This is not a dislocation, however.

The hypertrophic changes which occur with age are confusing in the interpretation of plates following injury. It is possible that local hypertrophic changes between two vertebræ may be the result of an injury, but even this has not been proven. The general hypertrophic changes they feel certain have no relationship to one injury. Acute osteomyelitis may be followed by new bone formation which simulates local hypertrophic changes. They attempt to distinguish true infectious arthritis from these hypertrophic changes by the fact that the new bone formation following the former condition is located on the lateral margins of the vertebra while the pathology of the latter condition is located on the anterior margin of the vertebra.

They emphasize that complete fusion of two vertebræ is always due to an infectious process, most often tuberculosis or a congenital anomaly. Tumors and syphilitic changes are rarely met with in industrial cases.

LEO G. RIGLER, M.D.

***X*-RAY DIFFERENTIAL DIAGNOSIS IN PULMONARY TUBERCULOSIS:** H. L. Sampson (Trudeau Sanatorium, Annual Report 23). Inasmuch as analysis of roentgenograms lies in one's ability to understand the reasons for normal or abnormal shadows, one must necessarily acquaint himself with roentgenograms of the theoretically normal parts under consideration. It is true that the theoretically normal, in the case of lungs, may vary within wide limits. However, that should not deter us in attempting to standardize such a normal, bearing in mind that time and accumulation of knowledge may tear down our previous concepts.

In the normal lungs we have two fields traversed by many linear markings radiating from two central points. That all of this arborization is the result of shadows cast by pulmonary systems, viz.: vascular, bronchial and lymph, is probably accepted by all. That one system, the vascular, contributes mostly to these shadows can probably be demonstrated. It is also quite probable that the bronchial "tree" plays an important part, but ordinarily it is very difficult to "identify." The lymph channels also go unrecognized as such.

These said "trees" or linear markings start from a root and continue peripherally in a more or less uninterrupted fashion until the periphery is almost reached, becoming more delicate in consequence of their diminishing size. Any gross interference with this linear appearance obviously would suggest anatomical abnormality or a pathological change in the lung.

In the theoretically normal lung, we may find at the root a density or two, or possibly in the lung field a shadow or two of a similar character, only usually smaller, or a localized increase in the shadow, producing value of some of the linear markings. The question then arises, how numer-

ous can these densities or the stage of exaggeration of the linear markings become before we can regard them as evidence of past or present pulmonary disease. For this reason the author has submitted a division of roentgenograms into the following groups:

1. The theoretically normal:

This would mean a roentgenogram void of any abnormal densities. As this probably rarely exists we can standardize the "normal" as having one or a few abnormal densities at the root with possibly an occasional density in the parenchymal field.

2. Doubtful group:

Under this we have: More numerous densities, the root shadow more pronounced, a general haze in a portion of the pulmonary field, a tenting or peaking of the diaphragm, a secondary shadow in the extreme apex immediately under the second rib posteriorly and referred to as a pleural cap, and finally a slight localized or general accentuation of pulmonary markings.

3. Positive group:

Obviously this group includes anything in excess of the foregoing groups, namely, coalescing of isolated densities, blotching, shadows, fans, mottling, speckling, gross exaggeration of linear markings, heavy homogeneous shadows.

The following terms are used:

1. Exaggerations of lung markings, doubtful or definite.
2. Stringlike shadows.
3. Mottling, fine or coarse.
4. Areas of rarefaction and annular shadows.
5. Homogeneous densities—localized or general light marked.

The possibility of identifying pulmonary tuberculosis lies in the ability to recognize the tubercle and its accompanying changes. The same reasoning may be applied to other pathologcal conditions in the lung, namely, that they may produce characteristic shadows. Pulmonary abscess many times gives a very classical picture, viz., a localized homogeneous density with an area or areas of rarefaction, a fluid level, etc.

Bronchiectasis or purulent bronchitis with its heavy markings to the base rarely with a fluid level in the bronchiectatic cavities gives also a somewhat familiar picture.

Malignancy having such a variety of forms gives pictures where a description is almost impossible. However, usually there are massive localized shadows or general homogeneous densities. This may also be the case with other common or rarer forms of pulmonary disease. J. R. Fuchlow.

ROENTGEN-RAY THERAPY IN THE TREATMENT OF EXOPHTHALMIC GOITER: D. M. Goodwin, W. B. Long (Amer. Jour. of Med. Science, January, 1924) have made a study of the results obtained by roentgen-ray therapy in a series of selected cases of hyperthyroidism. They emphasized the fact that their report is submitted not particularly to recommend roentgen-ray therapy, but to record their observations on the clinical course of these cases of very definite toxic exophthalmic types. These cases all showed, in addition to the thyroid tumors, the usual symptoms of thyroid toxemia, namely, tachycardia, sweating, exophthalmus, loss of weight, and increased metabolism. With the exception of a few cases, all of these patients remained at home, following as closely as possible certain directions as to rest, diet, etc. They reported at the clinic once a week, and on these visits a record was made of their weight, pulse rate and subjective symptoms. Frequent estimations of the basal metabolic rate were made.

The roentgen-ray technique consisted in the administration of approximately two-fifths of an erythema dose, filtered through aluminum, to alternate sides of the neck each week. The region to which the application was made embraced that part of the neck and thorax lying between the upper level of the thyroid and the upper level of the third rib. A uniform distance of 35 centimeters from the target to the skin was used. Filtration was accomplished by 3 millimeters of aluminum. The potential at the tube terminals was 140,000 volts each, corresponding to a spark gap of 10 inches between points. Five milliamperes were used, and the time of exposure was uniformly 5 minutes, with the exception that in highly toxic cases this dose was still further reduced. They state that such a dose as this may be given weekly to alternate sides of the neck for months without any evident permanent skin damage.

They include a series of five charts, showing the course of cases, with their recorded observations on the various symptoms, such as nervousness, sweating, palpitation, dyspnea, weakness, pulse, weight, and basal metabolism; also, the number of treatments and the dates on which they were given.

Examination of these charts gives the impression of very gratifying improvement under this type of therapy. There was a very definite increase in weight, with a very definite decline in the metabolism rate. The pulse curve usually showed a downward trend. The change produced in the subjective symptoms was marked, although the improvement in these cases was a matter of months. It usually took a period of five months before there was any impressive change.

However, all of the cases treated did not show the very satisfactory improvement in the subjective and objective symptoms, but apparently were uninfluenced by the therapy One of these cases, in which the course of the disease ap parently remained unchanged after a total of 22 treatments, became discouraged, and requested an operation. This gave an opportunity of studying the gland both macroscopically and microscopically. They point out that the operative technique was not rendered particularly difficult by the previous radiation. The microscopic examination showed no very definite changes which might be ascribed to the roentgen-ray, except the absence of dilated capillaries, which are found rather constantly in goiters of this type.

Besides the charts referred to, there are complete case reports in all of these cases.

In summarizing, they bring out the following points:

(1) In 5 of the 9 cases treated the results of treatment have been satisfactory.

(2) In 1 case the influence of treatment was doubtful, and in another no conclusion can be drawn because treatment was interrupted.

(3) In the 2 remaining cases the toxemia seemed to increase in spite of prolonged treatment.

(4) In the 5 favorable cases they were unable, as yet, to speak of the permanency of benefit or tendency to recurrence of symptoms. Dr. P. G. Boman.

BOOK REVIEWS

BOOKS RECEIVED FOR REVIEW

LIFE INSURANCE EXAMINATION. Frank W. Foxworthy, Ph.B., M.D., Indianapolis. Formerly Chairman Medical Section, American Life Convention, President American Association of Medical Examiners, etc. 738 pages. 156 illus. Cloth, $9.00. St. Louis: C. V. Mosby Company, 1924.

MODERN METHODS OF TREATMENT. Logan Glendenning, M.D., Asst. Prof. of Medicine, Lecturer on Therapeutics, Medical Dept. Univ. of Kansas; Attending Physician Kansas City General Hospital, etc. Chapters on special subjects by H. C. Anderson, M.D., J. D. Cowherd, M.D., Carl O. Rickter, M.G., F. C. Neff, M.D., E. H. Skinner, M.D., and E. R. De Weese, M.D. 692 pages. Illus. Cloth, $9.00. St. Louis: C. V. Mosby Co., 1924.

EAT YOUR WAY TO HEALTH. Robert Hugh Rose, A.B., M.D., Instructor Post Graduate Medical School, New York City. 264 pages. Cloth, $2.00. New York: Funk & Wagnalls Company, 1924.

A DIABETIC MANUAL. Elliott P. Joslin, M.D., Clinical Professor of Medicine, Harvard University. 211 pages. Illus. 3rd edition, revised. Cloth, $2.00. Philadelphia: Lea and Febiger, 1924.

This book, small compared to the one entitled "Treatment of Diabetes," by the same author, is still more pretentious than some of the other manuals for diabetic patients.

One of the greatest difficulties in the successful treatment of this disease is the education of the patient. How far that should go is subject to some difference of opinion. The more intelligent patients want extensive information and for them such a book as this is suitable. It is too complete, perhaps, for the average patient.

Included among the instructions for patients are numerous tables of great practical value in the treatment of this malady all included between the covers of one book. These include normal weights for children and adults and a very limited number of typical diets. Menus for a greater variety of combinations of food elements would have made the book more valuable to the profession.

The tables on food composition are very complete, including the so-called "diabetic foods," and are therefore of special value to the dietitian or physician who must so often be dietitian as well. The long list of diabetic recipes enables the patient to add variety to an otherwise sameness in diet.

RHUS DERMATITIS: Its Pathology and Chemotherapy. James B. McNair, Univ. of Chicago. 293 pages. 15 illus. 3 plates. Univ. of Chicago Press, 1923.

Poison ivy seems to have a special mission for spoiling vacations, and now that vacation time is here, attention turns toward the plant and its menace. Those who are risking infection will want to read about ivy-poisoning, its prevention and cure in James B. McNair's book.

Mr. McNair has set forth facts about poison ivy which may save the vacationist infinite discomfort. He has made identification of the plant easy, has told how to avoid infection, and how best to effect a cure. Contrary to popular opinion, the poison is not carried by the air or the pollen, but is held in the sap, coming to the surface only when the plant is injured. To avoid touching the plant is, therefore, the best preventative, but the poison may reach the susceptible person by way of intermediate agents.

As a complete preventative, McNair advises washing the exposed surface of the body with a solution of 5 per cent iron chloride in 50 per cent alcohol and water. This application will render harmless any ivy poison it touches; prevents the action of the poison before it enters the skin, and stops its spread from one part of the body to another. This substance was known to alchemists hundreds of years ago. It was used as a remedy for poison ivy in 1885, and by 1895 was known to act chemically on the poison.

This substance will work no miracle; its application will not immediately heal ivy-blistered skin. The injury caused by the poison is similar to a burn, and will not heal in a day. As the Great War has shown, the best remedy for burns is paraffin, and it is this substance that McNair has found most effective in stopping the pain and assisting in the repair of ivy-blistered skin. Vacationists who wish to avoid having their vacation ruined by the ivy plant will do well to include some iron-chloride mixture and a few paraffin candles in their kits. But before they start, let them read "Rhus Dermatitis!"

FOR SALE—General practice in village of 1,000. Sixty-five miles south of Twin Cities. Large country territory. Also care for three other country villages. Wonderful opportunity to make good. Address B100, care MINNESOTA MEDICINE.

MINNEAPOLIS OFFICE SPACE TO SUBLET — Very desirable office space at 323 La Salle Bldg., Minneapolis, to be sublet by Drs. Willson, Cabot and Wohlrabe. For information call at office or telephone Main 3220.

WANTED—Physician for an excellent Minnesota location, where money can be made right from the start. Nothing to buy. Address B95, care MINNESOTA MEDICINE.

PHYSICIAN'S OFFICE FOR RENT—Hamm Bldg., St. Paul. Centrally located. Dental office in connection, with furnished reception room. Call Cedar 2460 or address C1, care MINNESOTA MEDICINE.